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Tremendous Power of Air.

The tornado that recently passed over Lapeer county, Michigan, was the most violent ever experienced in that State. The damage to houses, barns, fences, and forests is very great. The heaviest loss will be the destruction of the valuable pine, and other timber in its course. So great was the force of the whirlwind, that nothing could withstand it. The giants of the forest, which have withstood the storms of a hundred years, were wrenched from their firm roots and tossed about like straws. Even stumps, firmly embedded in mother earth, were torn up and carried many rods. Old logs which had lain upon the ground for years, were disturbed and torn from their resting places. The air was literally filled with fence rails, limbs of trees, boards, rafters, shingles, &c., which were lifted to an immense hight. The course of the whirlwind was in a nearly east direction, ranging from twenty rods to half a mile in width, and making a clean sweep as it went. In some places even the culverts across the roads were torn up by the tornado, and the roads generally were filled up with a promiscuous assortment of timber and rubbish of all kinds. An eye witness says that the whirlwind presented a most singular appearance. He says the wind would rise in an immense whirl, drawing up rails, limbs of trees, boards, leaves, dirt, &c., to a great hight, when suddenly it would seem to drop again to the earth, and feed itself with a new supply of such things as were movable, and again rise, carrying up with it substances of great weight.

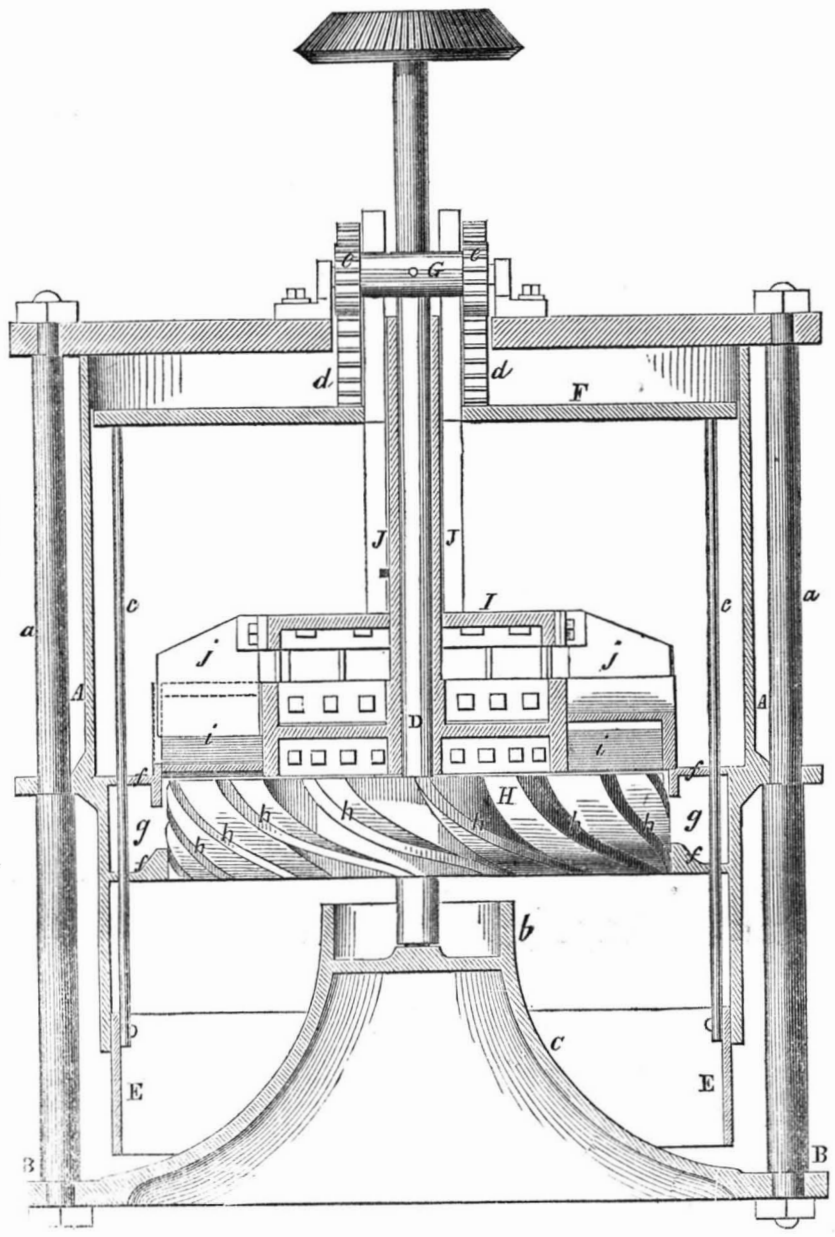
Taking Impressions of Natural Objects.

M. Loosey, the Austrian Consul-General, recently presented to the New York Farmers' Club, a book containing several beautiful and striking impressions of plants and flowers, which have been taken by a singular process discovered in the Imperial printing establishment in Vienna. If the original, of which a copy is to be taken, be a plant, flower, insect, or any vegetable substance, it is placed between a copper and lead plate, brought close together with screws, when two heavy rollers are passed over them. The original leaves itself impressed on the lead pla te with its whole surface.

If the colors are applied to the lead, as in printing copper plate, a striking resemblance is got in one impression; but if a great number of copies be required, the lead plate will not give it, on account of its softness. If the impressions are to be printed on a typographical press, it is stereotyped from the lead plate, and as many copies produced as may be required. If it is to be multiplied by copper-plate printing, the galvanizing process is had recourse to. The originals are covered by dissolved gutta percha, which, when removed, is covered with a solution of silver—thus rendering it fit for a matrix for galvan ic multiplication.

The London *Artizan* has published Lieut. Maury's Map of the Atlantic Course for Steamers, for avoiding collisions.

VAN DEWATER'S TURBINE WATER WHEEL.



The accompanying engraving is a vertical section of the water wheel of Henry Van Dewater, of the city of Albany, N.Y., embracing an improvement on his patent of October 1853, for which he has just taken measures to secure a patent.

The improvement consists, first, in the employment of a concave guide at the lower part of the casing underneath the wheel, in combination with a gate which surrounds it, to regulate the discharge of water from the casing or wheel. Second, in the employment of a peculiar gate and a series of shutes made and arranged to admit the requisite quantity of water to the wheel. Third, in surrounding the wheel with a chamber (filled with water) which, in connection with the peculiar form of the buckets, makes the water exert an upward pres ure to relieve the bearing step of the weight of the wheel.

A is the cylindrical casing of the wheel, which may be made of cast iron. It is secured in its upright position by the rods, *a a*, to a flanch, B, underneath the casing. This flanch is placed at the lower part of the guide or deflector, C, which is of a concave conical form, and projects upwards a suitable distance within the casing, A. On the upper end of this guide is the step or bearing of the wheel shaft. This step is secured by an upright ledge, *b*. Within the lower part of the casing there is a rim or band, E, which forms a gate. This gate works snugly within the casing, and has four vertical rods, *c c*, (two shown,) attached to it at opposite points. The upper ends of these rods are connected to cross bars, F, to which vertical racks, *d d*, are attached; these gear with the pinions, *e e*, at the end of a drum, G. Within the casing, A, and directly above the guide, C, is the wheel, H. It is fitted between lateral flanches, *f f*, which thus form a chamber or recess, *g*, around the wheel. The top and bottom edges of the buckets are radial with the wheel, and the intermediate points are gradually curved, so as to leave the spaces between the upper edges of the buckets wider than the spaces between the lower ends; the figure shows the form of the buckets. Directly above the wheel there is a fixed series of shutes or guides, *i*, which are placed directly over the buckets, *h*. The shutes are of a spiral form conforming to that of the buckets, and at the mouth of each there is a slide, *j*, connected to a circular rim, I, which encompasses the shaft, D. These slides, *j*, form the gate above the wheel. J J are two vertical racks attached to the upper surface of the rim, I. Two pinions in a drum (not shown) gear into these racks. By turning the drum, these pinions operate the racks, J J, and thus raise or lower the slides, *j* according to the direction the drum is turned. By turning the drum, G, the pinions, *e e*, take into the racks, *d d*, and elevate or lower the lower gate, E. The water from the flume flows into the upper part of the casing, and the slides, *j*, being open, it passes in and fills the entire casing, and is directed tangentially against the buckets of the wheel, the quantity being regulated by the guides and slides. As the spaces between the lower edges of the buckets are narrower than those between the upper ones, the water presses upward to a certain degree against the under surfaces of the buckets, and thus relieves the under step of the shaft, D, from top weight, thereby decreasing the friction. The surrounding water in the recess, *g*, acts upon the wheel when at work. By regulating the gate, E, the unequal draft of partial vacuum upon the column of water descending from the bottom of the wheel is obviated. It will be observed that when the gate, E, is raised or lowered, there will be an equal space all around the deflecting guide, C, so that the draft is equalized at all points around the wheel. In the ordinary French turbine a valve is used for this purpose, but this causes unequal draft, and is therefore inferior to the guide, C.

These improvements on the Jonval French turbine wheel by Mr. Van Dewater are obvious. His wheels have a high reputation for efficiency. We have now a number of certificates before us, from persons in various parts of our country using his wheels, all testifying to their high per centage of power and excellent construction.

More information may be obtained by letter addressed to Mr. Van Dewater.

Escape from Houses on Fire.

Mr. Braidwood, Superintendent of the London Fire Brigade, has published the following judicious directions to guide persons in escaping from houses on fire:

1. Be careful to acquaint yourself with the best means of exit from the house both at the top and bottom.

2. On the first alarm, reflect before you act. If in bed at the time, wrap yourself in a blanket or bedside carpet; open no more doors or windows than are absolutely necessary, and shut every door after you.

3. There is always from eight to twelve inches of pure air close to the ground; if you cannot, therefore, walk upright through the smoke, drop on your hands and knees and thus progress. A wetted silk handkerchief, a piece of flannel, or a worsted stocking drawn over the face, permits breathing, and, to a great extent, excludes the smoke.

4. If you can neither make your way upwards or downwards, get into a front room; if there is a family, see that they are all collected here, and keep the door closed as much as possible, for remember that smoke always follows a draft, and fire always rushes after smoke.

5. On no account throw yourself, or allow others to throw themselves, from the window. If no assistance is at hand, and you are in extremity, tie the sheets together, and having fastened one end to some heavy piece of furniture, let down the women and children one by one, by tying the end of the line of sheets around the waist, and lowering them through the window that is over the door, rather than through one that is over the area. You can easily let yourself down after the helpless are saved.

6. If a woman's clothes should catch fire, let her instantly roll herself over and over on the ground; if a man be present, let him throw her down and do the like, and then wrap her in a rug, coat, or the first woolen thing that is at hand.

The Ariel Steamship.

This vessel is one of the Vanderbilt Atlantic steamers, and has just made her first trip to Europe in twelve days. This is good time for a vessel of her capacity, she being quite small in comparison with the other steamers on the same route. Her engine is like that of our river steamboats, with the overhead beam.

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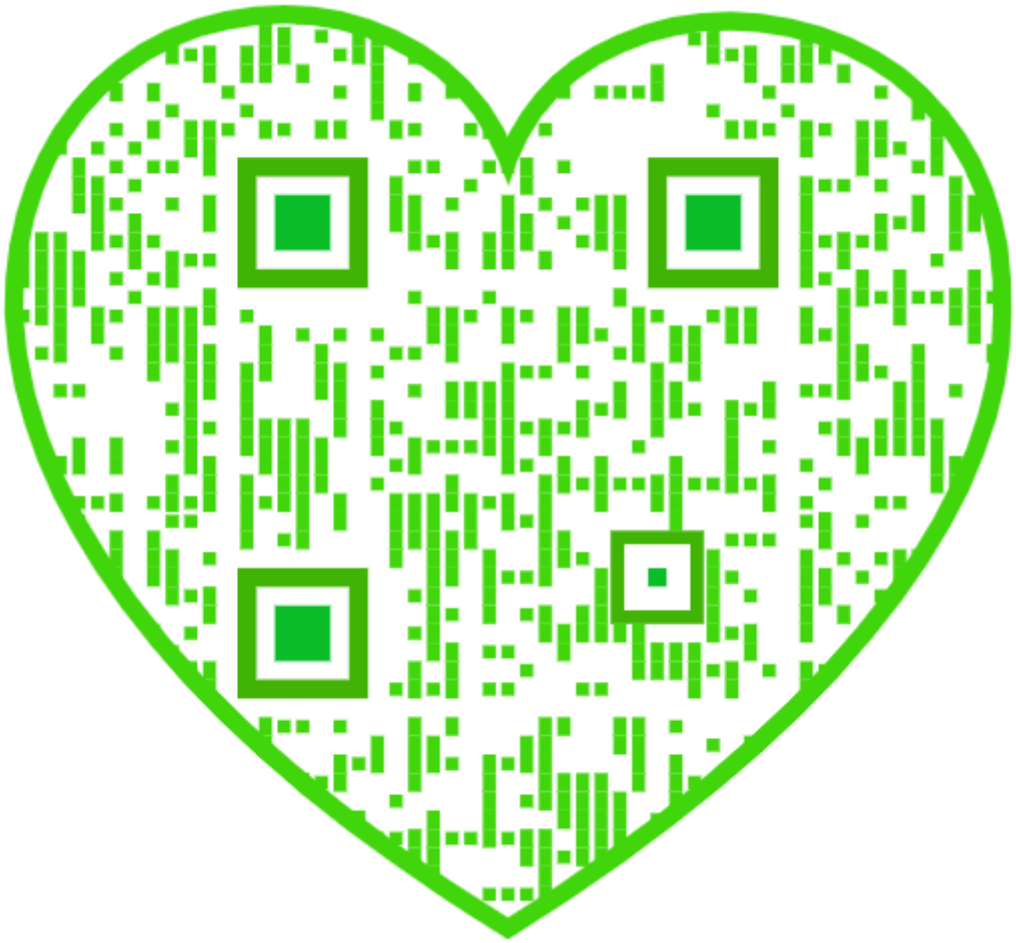

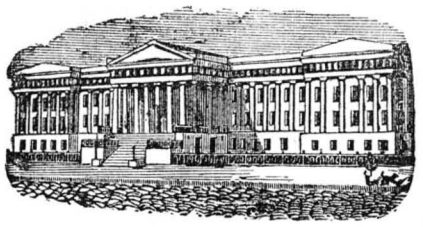

[Reported Officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office,

FOR THE WEEK ENDING JUNE 12, 1855.

FILTER—T. C. Clarke, of Camden, N. J.: I claim the application of the spring, so that it shall, in connection with the pressure of the incoming stream of water, work the upper and lower valves, always leaving the lower valve, C, open for the passage of sediment after the running of the water ceases, thus forming a self-cleansing filter, which cleansing is further promoted by the facility with which the filtering medium itself is changed and renewed by unscrewing the lid in which the filtering medium is secured.

HYDRANT FILTER—Thos. C. Clarke, of Camden, N. J.: I claim the combination of the filtering chamber, the rod, C, and the valves, B and D, whereby the simple operation of starting the water brings into operation the filter, and the stopping off the water opens the escape for the sediment.

FEED MOTION FOR SAW MILLS, &c.—C. M. Day, of New York City: I do not claim the clamps, e e, separately, but I claim the clamps, e e, attached to a lever, E, and working upon a pulley, D, in combination with the rack, H, and pinion, h, attached to the arm, F, all arranged, constructed, and operated as shown and described.

I also claim the levers, K, attached to the pivots, f f, of the clamps, and connected by the pin, j, and slot, k, at their inner ends, for the purpose of relieving the clamps from the pulley, D, when the carriage is gigged back.

[The devices claimed are superior in their construction, arrangement, and operation, to those now in use for the same purpose; they are more easily and more rapidly operated than others in use, and are therefore valuable improvements.]

MILL BUSHES—G. L. Dulany, of Mount Jackson, Va.: I claim the wedge cheeks, C C C, movable disk, D, and self-acting wedge, E, or their equivalents, combined and operating substantially in the manner and for the purposes set forth.

BUOYS FOR RAISING SUNKEN VESSELS—Elisha Fitzgerald, of New York City: I claim the attachment to the air bag, A, of an escape valve, fig. 4, B c, to prevent its bursting, when in consequence of the rising of the sunken ship, the pressure of the water around the bag is partially relieved, in the manner substantially as described.

SUPPLYING FURNACES WITH HOT AIR—Calvin Fletcher, of Cincinnati, O.: I am aware that the heating of air by contact with steam tubes has been done before.

But I claim the arrangement described, of the fan, a, steam tues, e e, together with the inlet passages for steam and cold air, and the discharge of hot air, and water of condensation, in the manner or its equivalent, and for the purposes set forth.

WINDOW SASHES—Wm. S. Ford, of New York City: I claim constructing, folding, hinged, or French windows, as shown, or in an equivalent way, so that the hinged sashes, C C, may be raised and lowered the same as the ordinary sliding sashes, and also be allowed to swing as French sashes, whereby said sashes are kept closed without the application of any special fastening and also rendered perfectly weather proof, as described.

[The objects of this invention are excellent and clearly set forth. The leaves of the windows are hinged to sliding strips, which, with the windows, are connected with balance weights and cords, and thus they (the windows) can be moved up and down like the common kind, and also open like the French kind. The back stiles of the sashes are provided with lips, which fit in recesses, and form a weather proof joint, thus remedying an evil belonging to French windows.]

FASTENING SCYTHES TO SNATHS—W. P. Greenleaf, of Washington, N. H.: I do not claim, separately, any of the parts or devices used by me in it.

But I claim the mode of fastening scythes to snaths by the employment of the ferrule, a a, at the end of the snath, the bolt, E, the nut, H, the notch, C, in the shank of the scythe, the toe or claw, D, of the scythe, and the perforated guide plate, G, constructed, formed, shaped, arranged and operating as described and set forth.

BEDSTEAD—Florian Hesz of Cincinnati, Ohio: I claim the four levers, 12, attached to the inside of the posts, in combination with the diagonal rods, 4, 4 4, 4, and plate, 6, connected with the screw, 7, all for the purpose of holding the side and end rails of the bedstead firmly to the posts, as set forth.

PLANING STAVES—M. T. Kennedy, of Fallston, Pa.: I do not claim, separately, the rotating disk, C, with the cutters, b, attached, for that has been used for analogous purposes.

But I claim the combination of the disk, C, and clam, the clamp being formed of a series of rods, K, passing through the disks, I I, and provided with springs, L, and lips, c, arranged and operating in the manner and for the purpose shown and described.

[The clamp, K, rotates, and the staves are secured between the edge of a lip on the rods, and a rotating band. The staves are inserted as the clamp rotates, one being placed between the lip of the uppermost rod and a band, and a cam forces the lip out to receive a stave when it instantly is closed by the spring. The improvement is simple and good.]

JOINTING STAVES—M. F. Kennedy, of Fallston, Pa.: I do not claim, separately, the reciprocating planers, for they have been previously used

But I claim the combination of the reciprocating planers, F F, and clamp, I, constructed, arranged, and operated in the manner and for the purpose shown and described.

[This improvement in jointing staves embraces reciprocating planes placed on a rod, connected with a fly wheel; the planes work in guides. The clamp for holding the staves to the jointing planer, is attached to a rod; each stave being held firmly in the clamp by a cam, and is set so as to cut the proper bevel. The stave descends and is presented to the jointing planes by the gravity of itself and the clamp, and then the clamp is elevated by pressing upon a treddle, either to turn the edge of the stave, or to place a new one in the clamp. The jointing is a planing operation; very correct and easily managed.]

DOOR LOCKS—J. C. Kline, of Pittsburg, Pa.: I claim the inclined or oblique faces, t t', and notch, d, of the bolt in connection with and operated by said key tumbler, substantially as described.

BUMPERS FOR SELF-ACTING CAR BRAKES—James J. McComb, of New Orleans, La.: I am aware that self-acting brakes of various forms have been essayed, which were intended to be brought into action by the momentum of the car, but in all these of which I have knowledge, the brake beam-, or the bumpers, when used abutted one against the other, and thus leaving but one half of the usual coupling distance available for bringing up the several parts of the brake to a proper bearing, and applying the brakes, which is found insufficient, and to couple the cars further apart to give the necessary distance to properly operate the brakes, has its equally objectionable features.

These, therefore I do not claim, but I claim allowing the brake beams of each car to abut against the car or platform of the car next to it, by which means I make available the whole play or distance between the cars in bringing up the brakes, and thus more effectually apply them than heretofore, substantially as described.

REVOLVING FIRE ARMS—Frederick Newbury, of Albany, N. Y.: I claim in fire arms having revolving cylinders, to carry their load and priming, the construction and use of a guard to prevent the fragments of exploded priming caps, from impeding the rotation of the cylinder, by covering up the cones with a movable metallic ring, containing for each cone a chamber as large as can be conveniently made within the ring to inclose each cone, each chamber having an aperture to permit the priming cap to pass through, and also having lateral openings to pass off the gas produced by the detonation of the cap, the whole substantially as set forth.

SAWING MACHINE—I. M. Newcomb, of Eden, Vt.: I claim the bar, F, secured to the arms, E, of the vibrating frame by a hinge joint, and its connection with the saw shaft, G, combined and operating substantially as described.

I also claim the guide arms of the carriage, H, combined and operating as described, and I also claim the lifting arm, W, and catch rod, X, combined with the hook, J, of the saw shaft, G; also the oblique tongue, K, and notched slide, N, combined and operating substantially as described.

PROPELLERS—J. H. Penny and Thos. B. Rogers, of New York City: We are aware that propellers or paddle wheels have heretofore been made having three throws or series of paddles, and also having the paddles enter and leave the water in a vertical position, and therefore we make no claim for such general device or arrangement.

But we claim the arrangement, as described, of the connecting rods, g, with the connecting heads, b, and the paddles, f, &c.; the connecting rods passing through the connecting heads, and the paddles being bolted to such rods, so that any one or more can be removed, if necessary, without interfering with the others, the whole being strong, and at the same time of light construction.

CUTTING CLAY INTO BRICKS—John Plumbe, of San Francisco, Cal.; I claim the mode of forming bricks or their equivalent, by means of wires or their equivalents, cutting upwards substantially as described, irrespective of the manner in which the clay is prepared and placed in the mold frame.

TUNING ACCORDEONS—E. A. Robbins, of Rochester, N. Y.: I claim such mode of tuning the reeds of accordeons and flutinas, as will require but four modes or forms of fingering, to perform twelve scales, any number of octaves within the compass of the instrument, as described.

STAVE MACHINE—G. H. Swan, of Bridgeport, Conn.: I claim the champering, leveling, and howeling barrels, kegs, &c., in fact any thing requiring a croze, chamfer, howel or level, by means of the two levers operated upon by springs and gauging or connecting rod, in such a manner as to gauge the work from the outside of the cask being round or not working exactly to the shape of the head truss hoop with any kind of croze knives or saws necessary to give the desired croze or groove, chamfer or bevel, howel and level, and the two levers are attached to the slide by pin or bolt acting on one or separate centers, and that slide made fast to the arm of the thumb or setscrew at any part from the shaft, or doing away with the slide and putting the pin or bolt directly through the arm at any point from the shaft requiree, consequently adjustable to any size.

SHEET METAL FOLDING MACHINES—Orson W. Stow, of Plantsville, Conn.: I do not claim the arrangement of the folding bars at right angles or thereabouts, when open, to the folding plate, and effecting the fold by the movement of both bars, to bend the edge and body of the plate on opposite sides of the stationary folding plate or former, as such an arrangement under a separate and disconnected operation of the bars is old.

But I claim, in folding machines which have the folding bars, E and G, arranged and operating in connection with a folding plate, D, as described, effecting the simultaneous action of the two folding bars, by so connecting or driving them, that upon operation being given to the one folding bar, the other folding bar is set in corresponding action or motion thereby; whereby the folding plate, D, is relieved from unequal and varying strain or pressure on its one side or face, the two folding bars are necessitated to act in unison, and the one operative lever serves to set both folding bars in motion, as set forth.

[This improvement relates to that description of folding machines in which folding bars are used, the faces of which stand at right angles or nearly so to the folding plate. The two folding bars are so combined in this machine, that when motion is given to one of them, both are caused to move simultaneously to complete the lap by a single movement.]

FAUCET—E. A. Sterry, of Norwich Town, Conn.: I am aware that valves have been made to rise and fall vertically without being turned upon their axes, and therefore I do not claim this.

But I claim the arrangement of the valve, e, the set screw, i, the grooved shank, d, and the screw enlargement, c, of the spindle of the key, with each other, and with the female screw on the sides of the chamber, a, and the groove, k, which acts through the threads of said screw, by which in a cock of the usual proportions, the valve can be moved up and down without being turned on its axis, substantially as set forth.

COUPLING FOR ORGANS AND MELODEONS—H. W. Smith, of Boston, Mass.: I claim the combination of the lever with the shoulder on the valve rod, operating in the manner and for the purpose described.

TENONING MACHINE—Christopher Sharps and George E. Adriance, of Hector, N. Y.: We claim, first, the arrangement and combination of the two planes and cutters for cutting the tenon, rest for supporting the spoke, drop for keeping it down upon the rest while the tenon is being cut, and guide box, B, having a mouth, F', and discharge, G, substantially as and for the purposes set forth.

Second, the combination and arrangement of the plane stocks, with planes arranged so as to move in and out, slotted springs to allow for said movements, springs, I I, and treddle, J J', for causing said expansion, substantially as and for the purposes set forth.

[These improvements relate to machines for cutting square tenons on the ends of spokes, and are designed to simplify their construction and lessen their liability of getting out of order. In case it is desired to change the size of a tenon, all that is necessary to make the cutters do this, is simply to press the foot upon a treddle, and cause the parts of the machine to assume such a position as to feed in and cut the tenon of the exact size desired. The cutter stocks are beautifully arranged to be adjusted laterally for such a purpose. The machine is very adaptable for all the purposes required in the execution of such work.]

DOOR LOCKS—J. C. Silvy, of New Orleans, La.: I claim the circular or solid circular bolts, one half in the lock, and the other half in the catch, as specified.

Second, the extension key, to lengthen or close the tumblers by means of a screw or slide, together with a scale to regulate the sliding bolt or bolts in the lock.

GUARD RAILS OF RAILROADS—Hosea D. Searles, of Rockford, Ill.: I am aware that several patents have been granted for central guard rails on rail ways, and that cars have been fitted with central wheels to run on such central rails. I am also aware that cars have been fitted with instruments like plow shares to remove obstructions from the rails, in front of both the side and central wheels of cars, of which Le Blank's cars, patented in France, and Ashcroft's, patented in this country, are examples; but I am not aware that prior to the date of my invention any one ever placed a series of guard ribs elevated considerably above the rails, the entire length of the track, and arranged the fingers of the cow-catcher to run between and outside of such ribs. Neither do I know that any other device, the equivalent of this, for taking up and preventing cars from running over limbs of trees, or fence rails laid across the track, has ever before been invented.

Therefore I claim the combination of elevated guard ribs, with the track, when the same are so arranged that the prongs of the cow catcher of the locomotive may run between them, substantially as set forth.

PLANK ROOFS FOR BUILDINGS—Samuel Taylor, of Petersham, Mass.: I do not claim making a roof by means of plain boards, rectangular in section, or by curved tiles made to overlap each other so as to break joints, nor by means of slates reposing on or supported by rafters provided with grooves or channels under the contiguous slates.

But I claim making roofs with overlapping wooden boards, to make each of the boards of saddle form as described, in order that when laid together in manner, as described, their contiguous plane surfaces, may not only lie in close contact, whereby they will add greatly to the stability and efficiency of the roof, but be so inclined as to prevent water from remaining between them, and causing or promoting their decay, my invention not being a mere change of form, unattended with any advantage, but one productive of new and useful results in making roofs of wooden boards.

I also claim the improvement of providing each of the grooves of the upper boards with an inverted metallic or water-tight lining or trough, x, for the purpose of protecting the joint directly under the same, when the boards become cracked or split, as described.

HEATING WROUGHT IRON WHEELS FOR FORGING—Wm R. Thompson, of Cleveland, Ohio: I claim the method of heating hubs for wrought-iron wheels, as described, the same being then forged and swedged, as set forth.

PORTABLE FLOATING FILTER—Nathaniel Waterman, of Boston, Mass.: I claim a portable floating water filter, substantially as described, wherein the water is filtered from the outside into the inside under an uniform pressure, regardless of the quantity of water in the filter, as set forth.

CURVILINEAR SAWING MACHINE.—Sheldon Warner, of Enfield, Mass.: I claim, first, placing the saws, J J, in frames, F F, which are allowed to move laterally in the saw frame or sash, B, and having said saws so attached to the frames, F F, as to be allowed to turn therein, said saws being turned by means of the rods, k n, attached to transverse bars, l, on the vertical rods, f, these rods being turned by the rods, n, and levers, p, the outer ends of the rods bearing against the pattern, D, and operated as said pattern moves, as shown and described.

Second, I claim straining and attaching the jaws, J J, to the frames, E F, by having bows, h, attached to the ends of the saws and screws, i, passing through them, the ends of said screws resting upon the top and bottom strips, c, of the frames, E F, as described.

[This invention relates to the sawing of scrolls or curved work, by means of patterns. The improvements consist in the peculiar devices and their arrangement, as claimed, by which two common saws, used for such work, are turned by the pattern, and their cutting edges presented properly to the stuff to cut in the required direction. The method of straining the saws, by the devices embraced in the second claim, is a new and useful improvement, valuable for such machinery.]

ARTIFICIAL FUEL—Wm. D. Beaumont, of Mobile, Ala.: I claim the manufacture of a new article of fuel, composed of coal screenings, clay or marl, pine straw, or litter, crude turpentine, and gypsum, or their equivalents, mixed in the proportions substantially as set forth.

SODA WATER GENERATORS—William Gee, of New York City: I claim the described construction of a soda water generator, that is to say, having the heads connected to the cylinder by a single bolt which shall also serve as a shaft or the agitator to revolve upon, in the manner and for the purposes as set forth.

BUCKETS OF PADDLE WHEELS—A. M. Glover, of Waterborough, S. C.: I claim the giving such form, viz., a plane concave to the paddle, that all the advantage of the concave is secured without loss of hold upon the water, and slip in backing vessels propelled by wheels, substantially in the manner set forth.

SELF-ACTING COTTON PRESS—Jonathan Grout, of Hocking City, O.: I claim the construction of a press, designed for the general purposes of a press, so arranged as to swing freely about an axis of motion, and having a lever or set of levers, with their fulcrums within the said axis of motion, so that when the press is swung out in one direction, the said levers are brought into such a position relative to the other parts, that they take hold of the beam and thrust it down as the press is swung back to its former position, and in a manner which allows the operation to be repeated, until the degree of pressure desired is attained, substantially set forth and described.

PRESSING TOBACCO IN PLUGS—George King—of Farmville, Va.: I claim, first, the box, E, and plunger, F', when arranged and operated substantially as shown, so that both the box and plunger have a reciprocating motion for the purpose of allowing the tobacco to be fed into the box, and also compressed therein, as described.

Second, I claim the combination of the box, E, and plunger, F, with the hopper, H, and slide, J, for the purpose as shown and described.

[This machine is simple and easily worked, and is stated in the specification as being capable of pressing from 1200 to 2400 plugs per hour by hand labor. The tobacco is placed in a hopper in rolls, and these are fed into a box by an automatic movement, when they are pressed rapidly into plugs by a plunger, and then discharged. This press is very simple in its construction, and not liable to get out of order.]

WHEAT FANS—Joseph Montgomery, of Lancaster, Pa., & James Montgomery, of Baltimore, Md.: We claim constructing the screen box with the addition of a plate or apron under its upper screen, for conveying whatever passes through said screen to the front part of the box, and of a fine screen at the bottom, for separating sand or grit from the small grain, and seeds caught therein, in combination with a box or its equivalent beneath, for collecting or conveying away the sand or grit, therein separated.

We also claim adding an adjustable board or shelf, H, in the front part of the shoe, so situated that light and bulky impurities blown from the apron, may be caught thereon, and conveyed out of the shoe, while sufficient space is left behind and below it, for the whole extent of screen beneath to be employed to receive the grain, substantially as set forth.

CUTTING THE EDGES OF BOOT AND SHOE SOLES—J. P. Molliere, of Lyons, France. Patented in France Jan. 5, 1855: I claim the cutting down or paring and sawing the edges of the soles and heels of boots and shoes by means of the circular tools, G and h, revolving upon horizontal, vertical, or angular axes, the whole constructed and operated substantially as described.

[This patent, by our law, embraces a term dating with the foreign patent.]

SEWING MACHINES—T. J. W. Robertson, of New York City: I claim making a needle thread, single, or chain stitch, by means of a detached and loosely held looper, b, and reciprocating needle, arranged and operating together, in such a manner that while the needle in its back stroke draws the slack of its thread on to or along and round the looper, the looper, without detaining the loop formed by the drawing of the slack of the needle thread on and along it, guides and keeps the loop open, and the needle and its thread in their next advance stroke, pass through the open loop, which, kept moving, and having the further feed of its own or needle thread passed through it, as specified, is drawn entirely over and off the looper, b, to complete the stitch, substantially as described.

SEWING MACHINES—I. M. Singer, of New York City: I am aware that the cloth, in sewing machines has been held to the periphery of the feed wheel, by yielding pressure, and therefore I wish it to be understood that I make no claim to this mode of operation.

I claim feeding the cloth or other substance in sewing machines, by means of a wheel hung on a vibrating lever, or equivalent therefor, and borne upward by a spring or its equivalent, against the under surface of and in combination with a fixed pad, substantially as described.

WIND MILL—C. R. Webb, of Philadelphia, Pa.: I do not claim any thing as to the form of sails, as my invention can be applied to all kinds.

I do not claim the general principles embraced in my arrangement of mechanisms for operating wind mills.

But I claim placing the two cog wheels in the head of the mill, so that they shall gear into each other in the center thereof, and bringing down the power from said wheels, by an oblique shaft, whose foot or bearing is vertically beneath the teeth in contact in the head of the mill.

SERPENTINE SPINNER TO CATCH FISH—Charles De Saxe (assignor to T. H. Bate) of New York City: I claim, a spinner, substantially as described, constructed of a piece of metal, e, twisted or coiled upon its edge, and then attached to and winding about a hook, or other piece of tackle, for the purpose set forth.

PRINTING PRESSES—J. G. Northrup, (assigner to J. D. Mather,) of Syracuse, N. Y.: I claim the manner by which I give motion to the bed of a printing press, by means of a vibrating connecting rod, one end of which is attached by a stud pin or wrist, to a stand that projects from the lower side of the bed, the other end being connected by a similar wrist to an endless chain, which passes around two wheels which revolve, thus producing an elongated crank motion.

I do not claim the application of a chain for this purpose; but I claim the manner of attaching, combining and communicating its motion to the bed, substantially as described.

METALLIC MEDIUM FOR FILTERING—O. C. Phelps (assignor to O. C. Phelps and John Holton,) of Boston, Mass.: I do not claim rolling wire gauze, by passing it between metallic rolls; neither do I claim the use of wire gauze as a filtering material, when the same is unprepared, in the manner described.

But I claim the use of disks of rolled wire gauze prepared and applied to the filter, in the manner substantially as set forth.

RULING LEATHER—Joshua Turner, Jr., of Charlestown, Mass. (assignor to Asa Bennett, of Boston, Mass., and Warren Covell, of Dedham, Mass.): I do not claim the combination of a printing roller with a movable bed; but I claim my improved manner of combining each of the two striping wheels of the described machine with its movable bed and inking or closing roller, the same consisting in applying said striping wheel to its shaft in such a manner as to enable it to rotate on the same, and to play freely thereon in any direction, in a plane perpendicularly thereto, and to such extent as to accommodate itself to the changes in the surface of the leather, or article to be striped, as specified, and at the same time keep in close contact with its coloring roller or cylinder.

I also claim combining with the series of striping wheels, arranged together and on a shaft, as described, a mechanism for raising and maintaining either one or more of them out of action with the surface to be striped and the coloring roller, during the movements of the remainder of such wheels, and the bed and surface to be striped, under them, as specified, such mechanism being a cross bar or frame, S, and its set of suspension hooks, t t t, arranged, supported, and made to operate substantially as described.

I also claim combining with the series of striping wheels and the bed, a mechanism not only for raising said wheels from a skin resting on the bed, and after has been striped by them, but for maintaining them entirely off the skin during the backward movement of it and the bed, as specified, the said mechanism being a rocker arm, u, with its weight, b', the catch or latch, w, the lifter, a', and the projection, c', as applied to either one or both ends of the shaft, a, and made to operate as explained.

I also claim combining with a series of striping wheels, a spout or receiver, P, and peripheral, and side or edge scrapers, g, operating with respect to the spout and wheels, substantially in manner and for the purpose, as specified.

CUTTING OUT BOOT AND SHOE SOLES—C. H. Griffin (assignor to himself and G. W. Otis,) of Lynn, Mass.: I am aware of the machine of Richard Richards, patented on the 16th Dec., 1854, the two cutting knives of such machine having been applied to opposite sides of a revolving shaft, such shaft being partially revolved at suitable periods of time, in order to bring alternately each cutting knife in succession into the required position for it to cut through the leather, when depressed by the frame or mechanism by which it was made to act upon the same. I therefore do not lay claim to any such method of applying and operating the knives, it being attended with an uncertainty of action to which my improvement is not liable.

But I claim the combination of the depresser bar with the reciprocating knife frame, its two movable knives, and their elevating springs or equivalent machinery, such being arranged and made to operate together, substantially as specified.

I also claim the combination of mechanism for imparting to the knife frame its intermittent reciprocating movements as described, the said combination consisting of the two momentum levers, W X, the barrel E, on the driving shaft, and the two sets of connecting straps, k l m n, the same being applied to the carriage and shaft, and made to operate substantially as set forth.

ATTACHING GUTTA PERCHA SOLES TO BOOTS AND SHOES. John W. Wimley, (assignor to J. A. B. Shaw,) of Philadelphia, Pa.: I am aware that india rubber, after being cut out and shaped like a sole, has been united to the insole and upper by means of an intermediating cement, caused to penetrate holes made in the insole and upper; but I do not claim this; nor do I claim uniting gutta percha and leather for any other purpose than that of manufacturing boots and shoes, as described.

But I claim manufacturing or making boots and shoes, with the outer sole made entirely of gutta percha, when the said outer soles are simultaneously formed and united to the upper and insole, by means of heat and pressure in a mold, substantially as described and set forth.

Prizes for Mowing Machines.

The Trustees of the Massachusetts Society for promoting Agriculture have offered a high reward for the best mowing machine that can be produced. A year's time is given to prepare for the trial, so that the metal and genius of our mowing-machine inventors and makers are thus challenged. The prize is $1000 to the maker or exhibitor of the best mowing machine, to be awarded in 1856.

To entitle any person to the premium, the machine, with full particulars of its principles of construction, weight, and selling price, must be entered for competition with the Trustees on or before the first day of June, 1856. A general trial will be had of all the competing machines, due notice of which will be given, together with all needful particulars at the commencement of the season of 1856.

The Trustees in awarding the *one thousand dollar* premium will not confine themselves to the single trial which will be afforded to competitors to exhibit the powers of their machines, but they will also take into account the merits of each as displayed in competing for this year's premium and in its ordinary working both for this and the coming year, whenever and wherever an opportunity is afforded of seeing it in operation.

All communications may be addressed to Thomas Motley, Jr., Jamaica Plains, or R. S. Fay, Boston, Mass.

Object of Salt in the Sea.

Professor Chapman, of University College, Toronto, has published an interesting paper on the object of sea water being salt, and after giving his objections to the usually received opinions, he urges the theory that the object is to regulate evaporation. If any temporary cause renders the amount of saline matter in the sea above its normal value, evaporation goes on more and more slowly. If this value be depreciated by the addition of fresh water in undue excess, the evaporation power is the more and more increased. He gives the results of various experiments in reference to evaporation on weighted quantities of ordinary rain water, and water holding in solution 2·6 per cent. of salt. The excess of loss of the rain water compared with the salt solution was, for the first twenty-four hours, 0·54 per cent; at the close of forty-eight hours, 1·04 per cent; after seventy-two hours, 1·46 per cent, and so on in increasing ratio.

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Wisconsin Iron.

The iron resources of our country are always of interest to us, and it affords us pleasure to present the following Report on the "Iron of Washington and Dodge Counties," of the State of Wisconsin, by James G. Percival, State Geologist:—

The iron ore, at Iron Ridge, Dodge Co., and Hartford, Washington Co., is a red peroxyd of iron, (of the same species as specular iron and red hematite,) chiefly of the variety called lenticular ore (seed or shot ore.) It forms a bed interposed between two limestone formations; that below obviously corresponding in its physical character and fossils to the upper shell bed of the Blue Limestone of the Mineral district, and that above in its physical character to the Upper Magnesia of the same district. Fossils are very rare in this overlying rock, and those chiefly corals, near the junction of the rock with the ore. They are quite different from the fossils in a corresponding situation in the Upper Magnesia, so as to render the determination of the overlying rock not immediately obvious. The ore bed has the same relative position in regard to the underlying rock as the *brown* and *green* rocks of the mineral district, which are situated at the base of the Upper Magnesia, immediately above the Blue Limestone. Those rocks are highly stained with iron, particularly the brown rock, which has nearly the color of the present ore, and accompany the lower mineral openings of the Upper Magnesian, in which the lead ore is associated with large quantities of iron ore (sulphuret of iron, and brown hematite; the latter derived from the decomposition of the former.) The iron ore, at the two localities above mentioned, is the same in its character and arrangement, and has the same geological relations. It forms, in its original position, a bed of thin slaty rock, composed of small flattened smooth grains, with some larger connections intermixed, either of a mamaellary form, or resembling very smooth rolled pebbles, but these obviously concretionary. The bed is generally very uniform in its character, but with occasional thicker and more compact layers. It is usually overlaid by a layer, 3 to 4 inches thick, of a very hard dark form, blue seamed compact ore, breaking with a conchoidal fracture, with occasional glossy seams of specular iron. This layer, in some instances, adheres firmly to the limestone above, and points of the same ore or stains of the red oxyd are found more or less disseminated through the adjoining rock.

Iron pyrites are also found disseminated through the immediately overlying limestone, and may be observed in the same block apparently passing from the unaltered pyrites at the center to red oxyd at the surface of the block. At Hartford irregular layers or pockets of red and white jointed clay, blended in larger and smaller segregations or patches, are formed in the limestone a few feet above the ore, very similar to the joint clay of the openings in the mineral districts, particularly those in its lower bed of the Upper Magnesian. This clay breaks by smooth seams into more or less regular fragments, sometimes very small, like those of the soap clay immediately investing the lead ore in some openings in the mineral districts. The rock adjoining these pockets of clay contains an unusual number of fossils (corals,) like that immediately overlying the ore. The ore is underlaid by a bed of red and blue clay, accompanied with fragments of a greenish concretionary limestone, with few or no fossils resembling similar concretionary layers in the lower part of the Upper Magnesian, and this by the upper shell bed of the blue limestone, usually much decomposed and broken, and accompanied with alternate layers of blue clay as in the mineral district.

At Iron Ridge, the ore bed underlies a line of bluff of the overlying limestone, about 30 feet high, extending 1-16 of a mile nearly north and south (N. 8° E.) This bluff is interrupted for about a quarter of a mile at the Mayville ore bed, and terminates abruptly both at the north and south; the limestone bearing around nearly from west to east. The hight of the ridge from the valley west, is about 60 feet; the upper half limestone, the lower half occupied by the ore bed, and the underlying clay and blue limestone. The limestone in this bluff is thick bedded, hard, and compact, of a very light gray color, and burns, though with difficulty, into a good white lime. The ore bed, where exposed by excavations as it underlies the rock. is composed of a very uniform mass of thinly chistose iron stone (rock ore,) of a light red brown color, but giving a bright red powder, and made up chiefly of very small flattened grains (seeds) of argillaceous red oxyd, with some larger smooth concretions disseminated. This is quite firm where formed in the pits sunk through the rock back of the bluffs, but softer in the excavations at the bluff, showing a tendency to disintegration. Where the ore meets the thick bedded rock above, a band, 2 to 4 inches thick, intervenes, composed of a very hard compact dark brown ore, giving a bright red streak and powder, and with occasional seams of specular iron. But in some instances a thin slaty marl is interposed between the limestone and the ore, and in such cases the hard band appears to be wanting. At one of the excavations in the face of the bluff, a thin band of brown ferruginous limestone was found interposed in the ore, about six feet from its upper surface, thinning out towards the West, and becoming thicker as it passed under the limestone.

On the slope of the ridge below the limestone, and at the Mayville bed, in the cove between the two sections of the limestone bluff, and the south end of the ridge beyond the southern termination of the limestone bluff, the ore occurs loose and incoherent, but composed of the same flattened grains as the rock ore, with a few larger concretions intermixed. The ore here is arranged in layers, but less regularly than in the original bed, with more or less clay intermixed, both in horizontal and vertical seams, and with interposed irregular beds and pockets of bluish joint clay and a yellow brown loamy drift with bowlders of limestone; the whole presenting the appearance of a drift accumulation. The limestone and the underlying ore may be supposed to have originally extended further west, and to have been removed by the action of water, and the rock ore to have been disintegrated and then accumulated by eddies in the cove at the Mayville bed, and at the south end of the ridge, and to have been deposited by more gradual action, along the general slope of the ridge. This view of the subject will explain the great variety in the thickness of the loose seed ore at various points along the ridge; at the Mayville bed, including the interposed beds of clay and drift, about 30 feet, and at the summit of the south point of the ridge, about 10 feet, while on the slope of the ridge it gradually thins off from 8 to 10 feet above, towards the bottom.

Pits have been sunk through the rock at different distances from the bluff, and show the same arrangement of the bed as in the excavations in the rock in the face of the bluff, only less altered and disturbed. The thickness of the bed under the rock, in the south part of the ridge, appears to be about 15 feet. In one pit it was found to be 12 feet, but here the ore, or the clay beneath, appeared to have been removed by the action of a spring, causing a sinking of the rock at that point. At the north end of the ridge, in the bluff north of the Mayville bed, the thickness of the bed under the rock averages 10 feet (in one pit 12 feet.) A higher bluff of limestone extends along the west face of the ridge, from two to three miles north of Iron Ridge village, where two pits have been sunk below the rock of the bluff, showing a mere seam of the iron ore under the overlying limestone, below which, in one of the pits, the same clay and blue limestone were found as under the ore bed at Iron Ridge. The limestone bluff is there more than twice as high as that at Iron Ridge, and shows beneath the same thick bedded rock as at the latter, overlaid by a bed of nearly equal thickness of a thinner bedded limestone breaking into small jointed fragments, and this by another bed of thick bedded rock at the summit. The rock throughout is there as little fossiliferous as at Iron Ridge. The arrangement in these distinct beds corresponds with that common to all the limestone formations of the mineral district.

At Hartford the ore bed crops out under earth, on the west slope of the ridge at the village, south of the Rubicon, and in the south bank of that stream, and has been traced in wells and pits through the ridge to its east base adjoining the Rubicon. It is overlaid on the west, first by earth, then by a very thin bed of limestone in places, but disjointed; and further east by a firm bed of the same rock, 6 to 8 feet thick, under about twenty feet of earth, but again appears on the east slope as on the western. It has been sunk through only in one pit, towards the west, under the disjointed rock, and is there 7 feet thick, but thins out on both slopes, particularly on the eastern.—The ore appears here harder than at Iron Ridge. The loose seed ore is found only in comparatively small quantities on the west slope of the Ridge where the ore is separated from the limestone above by the same hard band as at Iron Ridge, presenting similar seams of specular iron. Pits have been sunk in the Ridge next east, where there is the same appearance of thinning out to a seam as in the high bluff north of Iron Ridge. These two instances indicate a thinning out both to the north and east, and the same, if opportunity offered, might probably be shown to the south and west. No discoveries of this ore have yet been made, except those at Iron Ridge and Hartford. The thin layers of red earth containing a few grains of the ore disseminated, found on the surface of the drift at a few points south-east of Iron Ridge, are undoubtedly due to the action of water, and are derived from that bed. It would seem probable that the ore forms extensive lenticular deposits or basins, thinning out around their edges, and occurring at different points along the junction of the two limestone formations between which it is included. The thickness of the ore would naturally differ in different deposits, according to their extent. Thus the deposit at Iron Ridge, which has been traced at least 1¼ miles north and south, and nearly the same distance east and west, shows a thickness of 15 to 16 feet under the limestone rock, while that at Hartford, which has not been traced to half that extent, shows a thickness of only seven feet. The available extent of the Hartford bed, on the north, is limited by the Rubicon, which runs from east to west, along the line of an apparent fault; the ore bed rising several feet above the level of the stream on the south, and the limestone presenting the same characters as the overlying limestone on the south, sinking below the level of the stream on the north.

From the statements above it will be seen that the ore available in quality occurs under two forms; the rock ore, its original form as it lies in place under the limestone, and the loose seed ore which has been apparently formed from the disintegration of the rock ore, and more or less modified in its deposition by drift action. The composition of the two cannot essentially differ, except that the latter is more or less intermixed with clay, and may have been modified by the action of decomposed organic matter, as in bog ore. A careful analysis of the two would determine the latter question. The loose ore is more easily excavated, but the rock ore would be reduced with greater facility, from its coherence. The hard band immediately adjoining the limestone above, although probably of superior quality, is in too small quantity to be of any importance, and is interesting only in pointing out the character of the ore.

The bed at Iron Ridge occupies an extent of nearly one mile from north to south (the Mayville bed not included,) along the side of a ridge where the bottom of the bed is above the base, so that the whole bed admits of easy drainage. The thickness of the bed under the rock varies from 10 to 15 feet; at the south point (at the village,) where the furnaces are to be erected, about 15 feet.—By placing the furnaces at the side of the bluff at the thickest part of the bed, the ore may be brought to them immediately, almost without labor. The largest deposit of loose ore at the south end of the ridge (in one point 20 feet thick,) is in the immediate vicinity, and the ore could be conveyed to the furnaces with nearly equal facility. Either of the two might thus be used, or the two might be mixed, as would be found most advantageous. But the rock ore would most probably be used to most advantage, and with its known extent would be inexhaustible.

This great deposit of ore is fortunately in the midst of a very extensive tract of heavily timbered country, which, with due economy, might for a long period furnish an abundant supply of fuel, and that of the best kind for the furnace, as the superiority of charcoal iron is acknowledged. The whole face of the ridge presents a series of springs, issuing both above and below the ore, and affording an abundant supply of water for steam power. The bed at Hartford is in the same heavily timbered country, and on the immediate bank of the Rubicon, a large mill stream. The Milwaukee and Horicon Railroad passes through Hartford Village, and only 1¼ miles from the village at Iron Ridge, and will be connected with the latter by a branch leading directly to the works. The surrounding country is of a superior character for agriculture, and will furnish abundantly all necessary supplies. It will thus be seen that these localities, particularly that at Iron Ridge, furnish the most desirable advantages for the manufacture of iron, and by the connected railroads for the transportation of the iron and the ore, from its abundance besides supplying the most extensive establishments on the spot, might be conveyed to other points, more or less remote, where it might be required, and that with great facility from the conveniencies of transportation, and thus every advantage might be taken of this vast deposit.

JAMES C. PERCIVAL.

The Gopher.

This animal, so often spoken of by travelers who have journeyed in Kansas, is peculiar to the Columbia and Missouri rivers and their tributaries. It is known in some localities as the camas rat, taking its name from a plant which is its favorite food. It lives beneath the surface of the earth, and throws up, in an incredible short time, an immense amount of dirt from its holes, which it carries in pouches by the sides of its face. The animal is classed by naturalists with the mole species. It ranges from five to eight inches in length, is of a mouse color, inclining to brown, with a short, thick tail, and its head is rather large and clumsy, owing to its cheek pouches. Some travelers say that it uses its broad feet for the purpose of bringing up earth, and that its pouches are used for other purposes.

Keeping Milk from Souring.

We have seen it recommended in a number of our exchanges, to use a little soda in sweet milk, for the purpose of preventing it becoming sour during very hot weather, and especially in thunder storms. We cannot but think that this is far from being a commendable plan. The best way to preserve milk is to keep it in clean vessels in a cool, dry, airy place. When milk becomes sour, the cream should at once be skimmed off for churning into butter.

There can be no doubt but a little soda, which is an alkali, will prevent milk from becoming acidulous, as soon as it otherwise would, but the cure is just as bad as the evil.

Nutriment of Onions.

Prof. Johnson gives his opinion in favor of onions as a very nutritious vegetable, and for laboring men with strong digestive powers quite healthy. It is not merely as a relish that onions are used so largely by many people, but because they give strength as well as a satisfaction of appetite. Prof. Johnson ranks onions in point of nutriment with peas.

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New Inventions.

Sulphur for Trees.

MESSRS. EDITORS—I noticed, in an article in the SCIENTIFIC AMERICAN of the 9th inst., that you express a doubt as to the potency of sulphur applied, as stated, in causing caterpillars or worms to leave trees. I would state that I have tried the substance in the form of flowers of sulphur (washed,) in the following way, successfully, upon the plum and several kinds of shade trees. I bored proportionably small holes according to the size of the trees, through the sap wood, six or eight in number at different hights around the trunk, though at a short distance from the ground. The holes were then packed two-thirds full of sulphur and plugged up with soft pine or cedar wood and coated over with a mixture of pitch and beeswax. I could not doubt for a moment that sulphur exhalations are obnoxious to tree worms, since from observation I know it to be the case with the red ant and some kinds of winged insects, while I think the view just set forth is well confirmed by the gradual disappear ance of the worm shortly after the application of sulphur. Sulphur is exhaled from the leaves just as it is from the skin of the human body after being taken internally and absorbed by the system, which absorption is certain in the case of the tree, for upon examination the following spring I found no sulphur, but a little gummy matter though the hole had nearly closed up. Silver coin carried in the pockets of individuals taking sulphur, soon become blackened with a coating of sulphuret of silver, and there remains every reason to suppose that sulphur in some form, could be detected upon the leaves of trees treated in the manner alluded to. JOHN H. RASER.

Reading, Pa., June 2, 1855.

[We know that the use of sulphur for the purpose stated has been prescribed a number of years since, but we never had seen any accounts published of its action—whether it was effectual or not. The foregoing is very satisfactory, and presents us with something to which our horticulturists would do well to take heed. That is, a tree may, in the manner described, be treated with medicine like animals, and this must be given periodically, not one dose to last for a number of years, but for one only, during the season of sap circulation.

Gang Plow.

The annexed engraving represents a gang plow, invented by G. W. Hildreth, of Lockport, N. Y., who has taken measures to secure a patent. It is made entirely of iron, except the pole to draw by. The main frame is in the form of a triangular elipse, A, for the purpose of shrinking on a wrought iron band to make it of any desired strength.

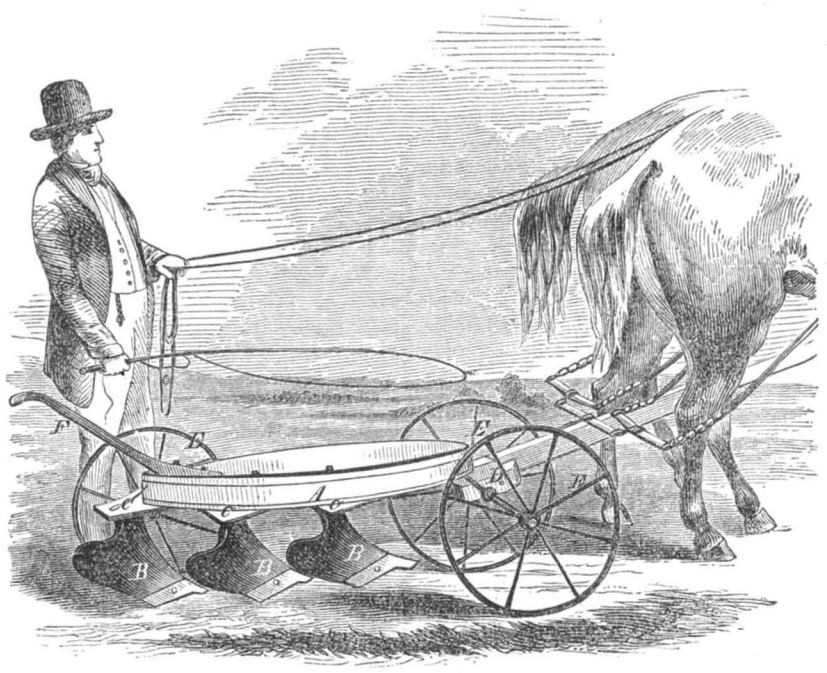
The forward end of said frame rides on an axletree, connected by a king-bolt, and bolster plates, D, allowing it to turn freely. The pole is attached by a device which the driver can easily change, to make the gang run more or less to land, which pole guides the whole gang with precision, by the off-horse walking in the furrow, and it requires no holding.

The wheels, E E, are large, and can be easily changed so as to carry the plow clear of the ground, in moving from one field to another, and also set to run the poles, B B B, any desired depth in the ground, from one to six inches, cutting and turning the whole surface clean. The gang will turn round without being touched by the hand, on a circle of three feet radius, and by lifting the rear end by the handle, F, it will turn at right angle.

The plows are made strong, and ground smooth, and are made on a sharp angle; they draw light and score easy, and are locked to the frame by a hook tongue and groove, C C C, and one carriage bolt which bolt is the weakest part of the fastening, and in case of running hard against any obstacle, where something must break, the bolt will break first, merely letting the plow drop off. A new bolt, costing less than five cents, repairs the break perfectly. The inventor says of it: "This implement is designed for all kinds of crop plowing or summer fallow; also for plowing corn, oat, and barley stubble, and fitting land for seed generally. It is a good implement for covering all kinds of seed sown broadcast; it has been used in almost every variety of soil, and has given universal satisfaction. It is well adapted to the soil in the Western States and the plantations of the South. It works first rate in muck, clay, and gravel.

The material of which this plow is made being iron, is strong and durable; the wheels are large, and having wrought-iron spokes and tire, are strong and light; it affords facility for changing the depth of the plows,

HILDRETH'S GANG PLOW.

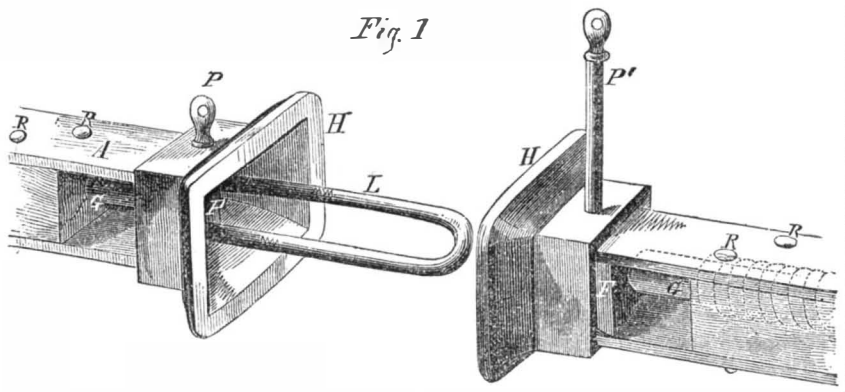


and changing the quantity of land; it requires no holding, and is easily turned round; a boy that can drive the off horse in the furrow can do as good work as a plowman, and it will work hard land that cannot be worked with a cultivator. The shears cut the whole surface of the ground and turn it over; it is very convenient for carrying off loose stone from the field while plowing."

These plows are manufactured by Mr. Hildreth, at Lockport from whom more information may be obtained by letter.

SELF ACTING CAR COUPLING.

Fig. 1

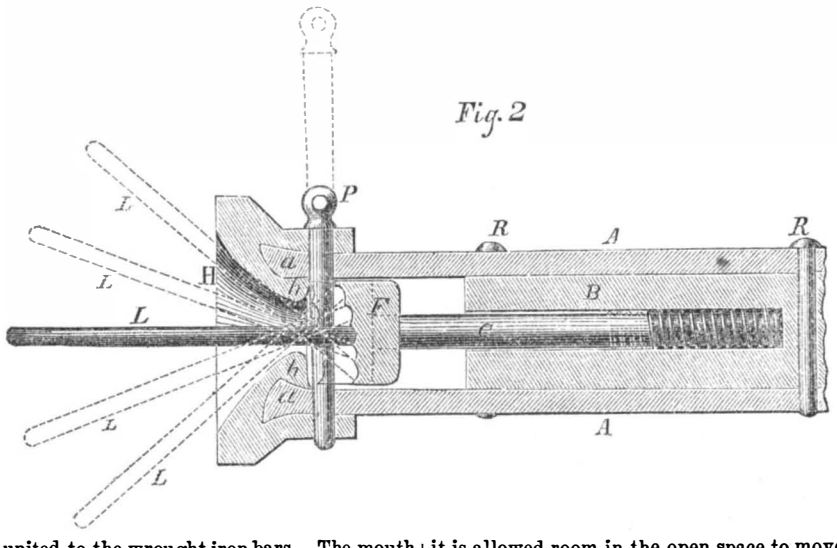


The annexed engravings represent an improvement in railroad car couplings, for which a patent was granted to D. A. Hopkins, of Elmira, N. Y., on the 1st of August last year.

Fig. 1 is a perspective view, showing two coupling boxes detached, and fig. 2 is a vertical longitudinal section through the center of one coupling box, and showing the coupling link in various positions; also a coupling pin locked in the link and out of the link. Similar letters refer to like parts.

The top or bottom bars or plates, A A, of each box are made of wrought iron, with their outer ends somewhat enlarged. These bars are riveted together by bolts, R R, and have a wooden block B, between them. The draw head, H, is made of cast iron, cast on the enlarged ends of the bars, A A, as shown in fig. 2, thus forming a draw head perfectly

Fig. 2



united to the wrought iron bars. The mouth of each head, H, is wide, while the throat, at *h h*, is very narrow. L is the connecting or coupling link. C (G in fig. 1) is a bolt passing into an opening in the wooden block, B; its inner end abuts against a coiled spring, S. F is the head of this spring bolt; it is allowed room in the open space to move back and forth. Its face is fluted with section grooves, to receive the end of the link, L, and retain it in various positions, as shown in fig. 2. P is the coupling pin. It will be observed that when the pin, P, is withdrawn and the cars uncoupled, that the spring bolt, C, will be forced forward in the box, and the pin, P, will then rest on its top as shown by the dotted lines, fig. 2, which represent the bolt and pin in this position. When it is desired to couple the two cars—by running back the front or bringing forward the rear one—the link, L, will enter the throat of the box, and push back the serrated head, F, of the spring bolt in the open space of the box, when the pin, P, will then drop through the opening of the link, and thus couple the cars. Owing to the narrow throat of the head, H, and the form of the face of F, this self acting coupling is perfectly adapted for cars of all hights, as shown by the various positions of the link, L, in dotted lines, fig. 2. This must be a very durable and strong draw head, as the crushing force comes on the cast iron head, H, while the tensile strain is sustained by the wrought iron bars, A A, because the pin, P, passes through them as well as the shoulder flange of the head, H. The mouth of the head, H, is so formed as to resist sudden and great shocks.

This self-acting car coupling has been in use for more than a year on the Canandaigua and Elmira Railroad, N. Y., and has been found perfectly practical, superior to, and more ecocomical than the ordinary kind. It has also been adopted by the New York and Erie Railroad, whose superintendent regards it as the only coupling yet brought before him adaptable for all the varying conditions and circumstances of railroads.

More information may be obtained by letter addressed to Mr. Hopkins, at Messrs. Fowler & Wells, No. 308 Broadway, this city. or W. P. Yates, Elmira, N. Y.

A New Light from the Spirit World.

The Cleveland *Plaindealer* gives an account of some experiments with a new light which the editor witnessed, and which it states is produced by the decomposition of water, by a machine constructed by Dr. Taylor, of that place—a clairvoyant physician—and all under spiritual direction entirely. It also states, that a caveat has been filed for the invention, but we cannot conceive how Dr. Taylor can ever obtain a patent for it. The patent laws require every person who applies for a patent to make oath that he is the original and first discoverer of the machine, composition, or whatever else it may be for which he desires a patent. Now, if Dr. Taylor constructed that machine under the direction of disembodied spirits, they must be the inventors, not he. According to law, then, if he expects to get a patent, he must apply for it as the legal administrator of the deceased inventors. If this won't create a row among the real heirs we are very much mistaken. It will certainly involve a new principle of law, demanding the presence of those spiritual inventors in a court of law, before the case can be settled. We are of opinion, however, that the light is really not worth much, and that it affords evidence of but little inventive powers in those spirits. The *Plaindealer* asserts that "distinguished chemists have pronounced it a triumph." We would like to know who they are? It also says, "the expense of the light will be next to nothing, as it is upon a self-acting principle;" in other words, it is a perpetual motion equal to that of the genius who used to carry himself about on a trencher. Well, wonders will never cease. The *Plaindealer* mentions the name of Mr. Paine in connection with this new light; we assure that gentlemen that his laurels are in danger, if the *Plaindealer* is correct.

Colza Oil.

This beautiful oil, which is used in all the French lighthouses, and which is superior to sperm for such purposes, should arrest the attention of our oil dealers and farmers.—The plants from which it is obtained, we have no doubt, can be cultivated with success in various parts of our country, and if this can be done it should be attended to.

The Rutland *Herald* says there are 700 men constantly employed quarrying marble in Rutland county, Vt., and there will be raised during the present year no less than 1,100,000 feet of marble.

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Scientific American.

NEW YORK, JUNE 23, 1855.

Adulterations of Food.

By an Act of Congress passed a few years since, examiners were appointed for the ports of our country to examine all medicines imported from foreign countries, and reject such as were found unfit for medical purposes, or were not properly labelled.—This was a very commendable and worthy act, but at the same time it savors too much of that wisdom which provides for the doctor instead of the cook. If the law had been made to embrace an examination of food, and all articles of daily table use also, it would have exhibited profound wisdom in our legislators, but failing in this, we cannot but look upon it as defective.

Two years since C. H. Peirce, M. D., of Cambridge, Mass., one of the examiners under the law, produced a work on the subject of adulterations in medicine, which, for the chemical information it contains, is of great value, but it does not touch the evil that we wish to bring to the notice of the public.—Thus, for example, it is well known that our people have a most exalted opinion of English mustard, and when any of them desires a pure article, he or she send to the apothecary's for the genuine English mustard, in the purity and powers of which they have, seemingly, unbounded reliance. Well, in this work of Dr. Peirce's we find no mention of mustard at all, so that our people, from it, might be led to infer that adulterations in it were outside of the bounds of probability. We do not know whether there is any English mustard sold by our apothecaries and druggists, or not, but we know that a great deal of mustard is sold under that name—the real *Simon pure* English. Now a work of the Sanatory Commission in London, by A. H. Hassal, M. D., chief analysist, has recently been published, in which it is stated that pure mustard is not to be found in England—all that is sold there is highly adulterated. If English mustard is no mustard at all in England, what kind of mustard is it in America? Who will answer this? We merely instance this case in order to point in general terms to others. Dr. Peirce, in the introduction to his work, justly remarks, "that although the general government prevents the entrance of false medicines in our country, it has no power to prevent home adulteration. This can only be prevented by State or Municipal legislation." He called, in 1853, upon the several States and cities to co-operate with the general government in judicious enactments to prevent such adulterations, but, as yet, his remarks have not found a response in a single instance, so far as we are informed. Now we want our States and cities to go further; we want them to enact laws to prevent adulterations in food of every description. The work published in London to which we have referred, opens up the leprosy of adulterating food as pursued in that city, and we cannot but believe, that in the absence of a just censorship over food in our cities, there is a vast amount of adulterated food manufactured and sold. If there is not, it will not be a very difficult nor expensive matter to set the public right, for, assuredly, the revelations which have been made respecting the gross adulterations of "*pure* Orange County milk," afford sufficient grounds for the worst suspicions of those who can in any way make money by deception in any kind of food adulteration whatever. The plan Dr. Hassal pursued in detecting and exposing adulterations of food, was to purchase the articles to be examined, either himself or his assistants, then analyse them, and publish the results of his examinations, giving the names of the persons from whom he purchased, and all the particulars of the analysis. This method of holding up the names of the dealers in impure food, is about as good a system of punishment as that pursued in Turkey in the days of old for adulterating bread, by nailing the baker by the ear up to his own door post. The plan pursued by the doctor was exceedingly simple and effective, and we cannot but recommend it to be adopted, under the supervision of a sanatory commission, in all our cities.

Prevention of Accidents in Factories.

The London *Critic*, in some comments upon accidents in factories, whereby the operatives are injured by the wheels and shafts, has the following felicitous illustration, which can be wisely applied to matters in our own country, State, and city. It asks, "What is a preventible accident? Can you prevent carelessness or disobedience? Can you prevent folly? A man is run over in the streets. Is that preventible? Certainly. You can do away with horses and vehicles, and even streets, and then the accident would become an impossibility."—[Ex.

[And upon this principle of reasoning the argument above is presented for a do-nothing policy towards preventing accidents from machinery in factories, because it is asserted these can only be prevented by abolishing factories altogether. But this is not true; for accidents can be prevented and have been prevented in factories, by the adoption of proper measures for the purpose. Two years ago an act was passed by the British Parliament for the prevention of accidents in factories, by compelling the owners to box their shafting, enclose their belting, &c. This law met with the most vehement opposition from the Manchester manufacturers; public meetings were called and representations were made that waste cotton would so accumulate in the boxing as to become exceedingly dangerous, on account of fires; and besides, it was asserted that these accidents could be prevented by carefulness without enforcing the law. So strong were those representations and so violent was the opposition to the law, that Government suspended it for one year (1854.) But instead of the number of accidents having subsequently decreased, they were just as numerous, so that a few months ago orders were sent to the Factory Commissioners to enforce the law rigidly, and this has called forth the above criticism of the *Critic*. The Government has been nobly justified in its determination to enforce the law by the upright and commendable conduct of some manufacturers, who at once complied with its provisions, and in whose factories no accidents had taken place during the past year.

Accidents will take place while the world endures, but will any person deny that the majority of accidents are not caused by carelessness, recklessness, or cupidity, against which wholesome laws strictly enforced, are not proper and effectual remedies? If stages and carriages were allowed to be driven through our streets without any restraint upon their drivers, would there not be twenty accidents for one which now takes place? Certainly there would. No person should ever talk about impossibilities in the prevention of accidents from machinery in factories.

Repeal of the Newspaper Stamp Act in England.

A bill for the repeal of this "tax on knowledge," has already passed one branch of Parliament, and is expected soon to become a law. This will be a great movement for England. With a population of about twenty-five millions, she has scarce a dozen daily newspapers in her whole domain. This is due to her obnoxious stamp laws, which require a payment to the government of two cents on each copy of a newspaper printed.

In anticipation of the new law, which is expected to pass in July next, the proprietors of the London *Illustrated News* announce that they shall double the size of their journal without increasing the price. This will give the public, as one of the first fruits of the repeal, a magnificently illustrated newspaper, of 32 large octavo pages, for 12½ cents—the cheapest paper of the kind in the world. Prospectuses for cheap daily newspapers, like those we enjoy here, have been issued in London and other cities. In Liverpool, a city having a population of 400,000 souls, they have at present only one daily newspaper, the *Northern Times*, six cents per copy, and it is of rather recent origin. Three new papers are, however, announced there to commence with the new law, to wit:—the *Daily Post*, at four cents, the *Daily News*, at two cents, and the *Events*, at one cent. In London the price of the first class daily paper is at present ten cents per copy.

The passage of a measure which will tend to fill the country with printing presses, and bring knowledge to the hearthstones of England's now thirsting millions, will be an occasion for general rejoicing among her people. Its effects will be deeply felt all over Europe. Cheap newspapers are the wings of liberal ideas. Before them despotism must crumble.

Ship Canal Across the Isthmus of Suez.

M. Lesseps, a distinguished engineer in the service of the Viceroy of Egypt, proposes to re-open the canal which in ancient times connected the Mediterranean with the Red Sea, so as to make it available for the largest ships. He declares the undertaking practicable and easy of execution. And in this he is sustained by the opinion of all engineers who have made an examination of the country between the two seas. In this great work the projectors are but following the footsteps of some of the earliest sovereigns of Egypt. Sesostris, Alexander, Cæsar, Amron, the Arab conqueror, Napoleon I, and Mohamet Ali, each in his turn sought to open the communication. It is known, too, not only as a matter of history, but also by existing traces, that the canal was cut and long in use.

[The above we have seen in a number of our cotemporaries, and we must say that it appears to us there must be some mistake respecting it. We have never understood that a canal existed in ancient times connecting the two seas; and it is a matter of history that the French engineer Le Pere, who surveyed under Napoleon I, reported that it was impracticable, owing to a difference of some 14 feet in the level of the two waters. This error was detected in the survey of the Isthmus for the construction of a railroad a few years ago. The ancient canal of Darius Hystapis connected only the Nile with the Red Sea, and it was built high above the level of the Mediterranean waters. This old canal was 150 feet wide, and 30 feet deep. It has not been in use for twelve centuries.

Signalizing Between Guard and Driver.

Mr. R. H. Thomas, of Kidsgroove, Staffordshire, has recently forwarded a short notice of an arrangement for instantaneous communication between the guard and driver of a railway train. It consists of a tube in connection with a strong vessel, forming a compressed air reservoir, supplied by an eccentric on the axle of the guard's van, working a force pump. The air tube is connected with a safety-valve by a branch having a stop-cock and whistle. When the receiver is full, the pump may be detached either by hand or self-acting. When the driver or stoker signals to the guard, he simply turns a cock, giving vent to the compressed air, &c.

[The above is from the London *Artizan*, and describes the latest method devised in England for that simplest of all things—communicating between the conductor of a railroad train and the engineer on the locomotive. No train is considered safe in this country unless there is a cord running through or over every car, and connecting with a gong on the locomotive, which cord, in case of accident, the conductor or passenger pulls, and so signalizes the engineer to stop. Although this simple contrivance has been in use here for years, with the utmost success, our transatlantic friends refuse to adopt it. They are content to employ some such bungling contrivance as above described. Another of their plans, which we read not long ago, was to have a large gong placed over the engineer's head, and to furnish the conductor with a bow and arrow. The conductor, or guard as he is there called, has a seat on the top of one of the cars, and it was to be made his duty, in case of accident, to shoot at the gong and so alarm the engineer.

A Large Knitting Factory.

The village of Cohoes, on the lower falls of the Mohawk, N. Y., is one of the best for manufacturing purposes in our country, and has progressed rapidly within the past ten years. A new factory for the manufacture of knit fabrics, such as drawers, &c., has recently been set in operation there which is said to be the largest one of the kind in the world: it is 305 feet long, 75 feet wide, and 6 stories high. It is designed to give employment to 600 operatives; the rooms are stated to be well ventilated, commodious, and cheerful. The name of the new factory is "The Mohawk River Mill." The machinery used embraces all of the most recent improvements.

New Inventions.

BENDING TIMBER—The *Tribune* of the 12th inst. describes a machine for bending ship timber, which, it says, "has *recently* been tested in Boston." This is good for a daily newspaper. This same machine is that of Mr. Blanchard, the well-known inventor, patented now for some years; and what is stated to be so very new in this announcement, as having occurred recently at Boston, might have been witnessed by the editor for nearly two years, within a distance of less than two miles from his office.

Gumming Saws.

A. G. Drake, of Sturgis, Mich., informs us that a piece of sheet iron, No. 16 in size, and made into a circular plate 16 inches in diamter, and placed in a wooden collar, which comes within 2½ inches of its edge, to support it, and then made to receive a high velocity, will cut the teeth of a buzz saw in a superior manner and in one half the time required by common gummers. The edge of the sheet-iron disk, must be smooth, and the saw must be moved cautiously and steadily towards it.

Insulating Telegraph Wires.

James Reynolds, of this city, informs us that a telegraph wire, coated with gutta percha, was laid in the North River between New York and Jersey City, in 1846, and that it worked successfully. He says that the article in the New York *Herald*, two weeks since, on the Ocean Telegraph, in which it is stated that the insulating qualities of gutta percha, were discovered in 1850, must therefore be wrong.

Improper Use of Laudanum.

The use of this preparation of opium is becoming fearfully prevalent among the female sex of our population. A lady writing to the New York *Times*, states she has recently discovered that five of her female acquaintances, belonging to the more wealthy classes in our city, are habitual partakers of it. It is fast destroying their mental and physical powers; they are, in short, opium drunkards. The vice is worse than intoxication from alcoholic drinks.

Lime and Salt.

A discussion took place last week in the New York Farmers' Club, respecting the combination of salt and lime. It has been said that salt and quicklime, when mixed together, unite chemically, and form carbonate of soda and chloride of lime. This was denied by Mr. Judd in opposition to some chemists present. He asserted that no chemical change took place in the mixing of these substances, and requested those who thought differently to furnish respectable proof to the contrary. This was not done, and he remained master of the contest. We rather think he is right, for we cannot conceive how carbonate of soda could be produced from a mixture which contains no carbon.

Vesuvius in Repose.

The late news from Europe conveys the intelligence that Mount Vesuvius had gone to take a nap, and that the finale of the eruption was quite a gentle scene—very different from what was anticipated.

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Foreign Editorial Correspondence.—No. 4.

Paris Exhibition, &c.

PARIS, May 24, 1855.

The temporary suspension of the labors in the Palace of Industry, caused by the preparations for its opening, has been succeeded by still greater activity, and everything is going forward rapidly to completion. It was a very wise move on the part of the management to fix the price of admission, for a few weeks, at five francs, as it keeps back a crowd that might seriously interfere with the operations inside. I think the Exhibition will not be completed before the 1st of July.

In workmanship and finish I think the French mechanics unequalled, and I think they exhibit more taste in proportions.—French lathes, printing presses, etc., look much handsomer than those of any other country, and are evidently as simple in their construction, but they do not show strength and durability. As there is more physical substance in a beef and beer-fed Englishman than in the bread and wine-fed Frenchman, so is there more solidity in English productions.

Some time since an equestrian statue of Gen. Jackson was uncovered at Washington amidst a very proper display of patriotic feeling. A much better one of Napoleon III. was erected a few days since at the east end of the Palace of Industry, and the fact was scarcely mentioned by the papers.

A citizen of Albany, N. Y., has sent a model of an American steamboat of 2000 horse power; it has arrived in a damaged condition, and, contrary to the expectation of the American Commissioner, it proves to be a most miserable affair. I regret that the exhibitor did not better understand the felicity of foreign artists in modeling and decoration, as otherwise he would have kept his model steamboat out of the country.

In the Austrian Department there is a very neat and finely made model of an American boat of the second class, copied from some steamers made in our country for the navigation of the Danube. It is an honorable representative of this branch of our interests, and will attract many visitors.

The American Commission holds its meetings once each week for the purpose of discussing the affairs of the Exhibition, and for arranging plans for carrying out the best interests of the Exhibition. At a late meeting it was voted to appoint a committee of three to assist one of the Commissioners at the Machinery Arcade, who had volunteered to attend there daily. The Commissioner in question very politely thanked the committee for the reinforcement, and stated that thus far his duties had been confined principally to traveling up and down the building—which is three-quarters of a mile in length—searching for boxes, and as this business had become very dull, he felt obliged for the relief he should have in the company of his colleagues.

There are to be some eighteen sewing machines from the best New York makers, besides an extensive show of india rubber goods by Goodyear & Morey. These will form interesting features in the United States Department, and save us from an almost total wreck.

Speaking of india rubber reminds me of a statement I saw in one of the New York daily papers in regard to the great success of that interest here. It was to the effect that one of the parties, a citizen of the United States, besides realizing some $300,000 from the sale of the patent here, was to receive a large salary for superintending the works of the Company. This all sounds very pretty in the newspaper, but upon inquiry at reliable sources I am informed that the statement is *gaseous*. The business, however, promises well, and therefore such electroplating in the newspapers is not required.

In looking over the catalogue of exhibitors in the Exhibition, I noticed that France has nearly 10,000, Great Britain 2,000, Austria 1800, Prussia 1200, Belgium 700, Spain 500. Mexico 104, and the United States about 100.

I notice among the articles in the English Department a large church bell, with an improved method of hanging, which has a novel quality of much importance. To the shank of the bell is fixed a toothed wheel, into which a pinion or an endless screw is made to gear, so that the bell may be readily turned with a crank, and thus present a fresh surface to the clapper or tongue. This prevents all uneven wear, and must render the bell much more durable.

There are also exhibited by a Birmingham house some very beautiful cases made entirely of glass, except the bottom, which is wood. The plates are supported by flint glass pillars or sash bars, and thus afford an easy transmission of light into the case; they can be more readily kept in order than brass or silver-plated frames. They look handsome.

I was interested in a fine collection of excellent glazed earthen-ware from Lambeth, for the manufacture of the various acids; one colossal vessel, said to be the largest thing of the kind in the world, holds 400 gallons, and has an average thickness of three-quarters of an inch. The glazing is the best I have ever seen, and is said to be proof against acids not solvents of vitreous bodies.

From present appearances agricultural implements will be as plenty as blackberries in August. I am glad of this, for I am of the opinion that few countries need spurring up in this direction more than France. As I passed through the northern part of the country I had some opportunity to judge of this from the rude implements I saw in use, and the general prevalence of female labor in the field; and even England, although a better cultivated country than the United States, falls behind in good and convenient agricultural machinery. One great obstacle to the progress of agricultural improvement in France, is the prevailing ignorance of its farmers. They read no publication devoted to their interests, and are satisfied to pursue a system that would seem little better than barbarism in our country.

Good common schools would help the rural population of France far more than gunpowder.

There are several very respectable scientific publications issued here, but they are seriously crippled for want of support. I have not been able to learn of a single work of the kind that gives any fair return for the talent bestowed upon it. The cheap issues of French novelists meet an extensive sale, and like too many of the same class in the United States, mechanics in Paris spend their leisure in reading trash, and at places of profitless amusements.

I have noticed that several of the scientific journals have re-produced from the SCIENTIFIC AMERICAN, the excellent article of John F. Mascher, on Daguerreotyping without a camera. This subject is of much interest here, and many experiments are made to perfect an art that had its origin in this country. The pictures produced here are not so clear and expressive, probably from the want of the bright sun and clear American atmosphere. The English pictures are usually very poor, much poorer than the French.

S.H.W.

European Inventions, Discoveries, &c.

SMOKELESS FURNACE—We have during the week inspected an entirely new arrangement of steam boiler furnace, in action, on a 25 horse power boiler, at the granaries and flour mills of Mr. Edward Gripper, Winchester wharf, Southwark. The principle of construction is that of mechanical motion applied to the bars, but different to anything yet introduced. Every alternate bar is so connected with a cross-piece at each end as to form one entire movable frame, which is connected by gearing with the motive power. The motion given to it is angular; first, the bars rise very slowly about an inch above the stationary ones, they then move gradually in a lateral direction towards the bridge, again sink in a vertical direction about an inch below the other bars, and then move laterally forward to their original position. What are termed the stationary bars are not fixed as usual, but hung in such manner as exactly to balance the vibrating frame with the load of fuel which it has to move, thus taking but little power from the engine to keep them in motion. The fuel is fed through a hopper and regulating incline plane, and the whole is self-acting, requiring but little attention from the stoker. We were informed that this apparatus had been in constant use about six months, that no difficulties whatever arose from the mechanical motion; there was an entire absence of clinker, nearly perfect combustion of the fuel was effected, and during our visit not a particle of smoke was visible from the chimney. Mr. Gripper estimates the saving of fuel alone at about 10 per cent., besides numerous other advantages.—[London R.R. Jour.

NEW FEED APPARATUS FOR STEAM AND OTHER BOILERS—A patent has recently been secured by F. H. Sykes, of Piccadilly, London, for certain mechanical arrangements for supplying steam or other boilers or vessels with water or other fluid, independent of power from the engine, or any separate mechanical source. The apparatus consists of a pair of cylindrical copper vessels, firmly constructed to withstand the pressure of steam. These cylinders are furnished with pistons without rods, which prevent the steam admitted above them from touching the water below. The cylinders are closed at top and bottom, and connected by a pipe furnished with two valves, each having four ports in the seats and two in the valve itself, two always being open while other two are closed. One pipe from each valve is carried into the boiler, one entering its lower, the other its upper part; the first conveying steam into the cylindrical vessels, and the water from them to the boiler. One of the other pipes from the valves conveys the water from a reservoir to the bottom of the cylindrical vessels, and the other conveys the steam from them to a condenser. This pipe terminates in a coil in the reservoir, down which, as the steam passes, it is rapidly condensed, causing a partial vacuum. The apparatus is placed on a level with the water in the boiler, which when at the boiling point, a bridge cock is opened, admitting steam to the upper part of both cylinders, to drive out the air when it is again cut off. As the steam passes down the condensing tube from one vessel, the partial vacuum causes the water from the reservoir to rush into the bottom of that vessel, which then descends, which motion opens and shuts the valves, and causes a repetition of the operation in the other cylinder. A reciprocating motion is thus kept up, according to the evaporation going on in the boiler, and its consequent requirements for a supply of water, which is thus always kept at one level solely by the self-acting powers of the machine.

GAS FURNACE FOR CHEMICAL ANALYSES.—P. Hart, of Manchester, England, has introduced and patented a furnace for analytical purposes, intended to supersede the Russian spirit-furnace, and employing coal gas and steam as fuel. The principal feature in which it differs from most other gas furnaces consists in substituting a jet of steam for one of compressed air. The patentee states that by it he can get a platinum crucible to a white heat in a few seconds, and that it is fit for all operations in chemistry requiring such a flame as fusions and other analytical operations. It consists of a copper basin, with a cover soldered close on, about 5 in. in diameter, having at one side a short tube half an inch in diameter, at an angle of 45° with the horizon, well stoppered with a good cork. In the centre a small hole is drilled, into which is soldered one of the small copper tubes cut from a Leslie's gas-burner, one end slightly projecting inside and the other passing into an elbow joint, into which is screwed a common piece of gas tube connected with the supply. To set this apparatus to work, half fill the vessel with water through the large tube at the side, and set it in the ring of a retort-stand over a gas flame having tightly corked the tube. When the water boils, light the gas at the elbow joint in the center, the flame of which will then surround the small tube, and the steam rushing through its jet of fire, will produce, with the flame, an extremely hot brush of blue fire, exactly like that of a spirit-furnace.

The Zodiacal Light.

For two centuries past the zodiacal light has puzzled astronomers in assigning it a systematic function or condition. Tycho considered it to be an abnormal spring-evening twilight. Humboldt ascertained that it increased in light surprisingly the more he approached the equator in South America, and the South Sea. His views upon it, as expressed in his Cosmos, would lead any believer in his philosophy to come to the conclusion that our earth had a ring like Saturn's, and that it was a ring of equatorial vapor.

The rainbow looks as solid as a comet or planet, yet it is nothing but refractory light. In the equatorial regions of our atmosphere there must be a centrifugal ring of vapor more dense than at any point north or south of it, and whatever its effects may be on the ether of universal space, we must inevitably conclude that it would present to the eye of an observer placed on an adjacent planet the appearance of a ring.

I have frequently noticed beautiful and marked phenomena of refracted light occasioned by my balloon when sailing above a dense str atum of clouds, as pictured upon the cloud surface beneath. I have also seen it faintly pictured upon the earth where it was covered with green foliage, but particularly so on green grassy meadows. This phenomena did not always present itself. Hot sultry days, when the sky was charged with damp clouds, always produced the beautiful phenomena. There is a marked difference in the internal condition of clouds in regard to the wet and dry, warm and cold, light and dark; and there is a corresponding electrical tension accompanies these conditions.

That scientific circles should advert to the discovery of Lieut. Jones, or that Lieut. Jones should have made such a discovery is not to be much wondered at, after what Humboldt sets forth in his Cosmos, to wit:

"Great as is the obscurity which still envelopes the material cause of the zodiacal light, still, however, with the mathematical certainty that the solar atmosphere cannot reach beyond 9-20ths of the distance of Mercury, the opinion snpported by Laplace, Schubert, Arago, Poisson, and Biot, according to which the zodiacal light radiates from a vapory, flattened ring, freely revolving in space between the orbits of Venus and Ma s appears in the very different state of observation to be the most satisfactory. The outermost limits of the sun's atmosphere, like that of Saturn, could only extend to that point where the attraction of the universal or partial central body exactly balanced the centrifugal force; beyond this point the atmosphere must escape at a tangent, and continue its course either aggregated into spherical planets and satellites, or, when not aggregated into spheres, as solid and vaporous rings. From this point of view the ring or the zodiacal light comes within the category of planetary forms which are subject to the universal laws of formation."

The existence of a ring like Saturn's encircling our earth is sustained by several hypothesis, but its actual form and appearance, as demonstrated to the eye, is more the property of the inhabitants of other planets in our solar system. Horner calls the ring of Saturn a train of clouds.

JOHN WISE.

Lancaster, Pa., June 7th, 1855.

[The Lieut. Jones to whom the credit of the discovery of the zodiacal light is attributed, is the Rev. G. Jones, Chaplain to the Japan Exhibition, and who was solicited by friends before he sailed to make observations on it. This he did in various parts of the world, for three years, and the result claimed for his research is, that the zodiacal light is a ring around the earth inside of the moon's orbit. Some have supposed that the zodiacal light was caused by nebulæ; and others that it was caused by the refraction of light. The discovery of the earth being surrounded with a ring is not new, and does not belong to the Rev. G. Jones. Such a ring was pointed out and described by Lieut. Maury years ago in his first edition of his wind and current charts. The discovery of the zodiacal light being that ring, however, is new, and belongs to Mr. Jones.

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TO CORRESPONDENTS.

B. C. M., of Ohio—You have been anticipated on your compass arrangement. Lemuel Langley, of Norfolk, Va., obtained a patent for a compass which could be read on both sides, so far back as May, 1828. As his account of the improvement is rather novel we will make a short extract from his specification:—"The object of my said improvement is to dispense altogether with the binnacle, in which the compass is ordinarily fixed, to cause it to answer all the purposes of a "tell-tale," and to secure it against accident from cannon shot, the shipping of heavy seas, or other causes of injury. The mode in which these ends are attained, is by cutting a hole through the deck of the vessel at or near the place where the binnacle is usually situated; this hole is cut through into the cabin, and within it is placed the compass with its box, suspended in the usual way, and when so situated it is completely out of the reach of cannon or other shot. In order to cause it to act as a "tell-tale," the compass box is made with a glass bottom, so that the card can be seen as perfectly in the cabin as upon deck; I also make the compass card translucent, or semi-transparent, in consequence of which it may always be lighted from below, and will be much more plainly seen at night, than when lighted in the ordinary way. The compass is defended at top by a very thick piece of glass; such as I have used has been three-fourths of an inch in thickness, and this is also defended by a rim, or band, projecting above the deck; the lower side of the box is also glazed, and I sometimes contemplate making the sides of the box of glass, should it be desirable to admit light in that way.

What I claim as new in the above described invention, is the fixing of the compass entirely within the planking of the deck of a vessel; and the mode of rendering it equally visible, both upon deck and in the cabin.

J. B. M.—Your invention had better not be published until patented. Paying the government fee and forwarding a description will secure you nothing; the only way is to make a regular application for a patent. Should you not come on, send a model and government fee of $30, and we will put your case through. There was no address on your letter.

M. E. S., of ———.—Your water feeder invention was patented in the year 1833; the patent has now expired and the invention is public property.

H. H. A., of Ill.—Appleton & Co., John Wiley, and Putam & Co., of this city, will import any of the foreign works for you which you have named. Communicate with either of them by letter: we do not know their price.

G. W. R.' of Iowa—The making of shot was illustrated in Vol. 7, Sci. Am.; it is made by pouring the molten lead through a seive down a tube, and sending a current of air up through it to cool the shot as it falls.

R. K. C., of Va.—In England the first applicant for a patent receives the same whether he is the inventor or not. Hence there is danger of anticipation when the invention is exposed or patented here, prior to obtaining preliminary security there. But such exposure makes no difference, provided the thing is new in England when the application or the British Patent is made. For France the applicant must be the inventor, and the invention must not have been in use abroad prior to the application for a patent.

N. C. P., of N. H.—Your plan of mill is old; it is not patentable; it was never made to work well. $1 received.

L. L., of Pa.—You are perfectly correct respecting a house covered with sheet iron being more safe than one covered with shingles, if it has a good metallic connection with the earth: but as it would be covered with paint, you must use a projecting rod.

W. F. G., of Mass.—We are not acquainted with a single good work for beginners on the subject of "Painting and Drawing,"—oil painting we suppose you mean.

J. C., of N. Y.—We cannot give you the information desired, that is, positive knowledge of the process for making the powders but it appears to us that the red is pure dry copper, and the green an oxyd, a mixture of the metal with verdigris.

C. W. McC., of N. Y.—There is a treatise on the functions of the skin by Dr. Wilson; we think the price is twenty-five cents. Appleton & Co. are the publishers. All your other requests have been complied with. Your subscription extends to the end of the volume.

H. P., of Brooklyn—You must be able to specify the chemical difference between your oil and others, before you can obtain a patent; but you can obtain a patent for the process—that is wherein it differs from other processes.

W. H., of N. Y.—The use of the small boiler, within the large one, is not new: we do not recollect where we have seen or read of it, but the idea is an old one to us; the action is much the same as you describe in a single boiler; the steam is generally in contact with the fire surface, and by reason of its lesser specific gravity, rises through the water till it collects above the surface, circulating through the water in so doing.

J. W. B., of Va.—You can apply a wind mill to your barn with success and without the least difficulty. Correspond with the Holliday Wind Mill Co., South Coventry, Ct., as to size, price, &c. For security against lightning, run up a rod above the mill.

H. K. W., of Ohio—We have requested the Newark Machine Co., of O., to attend to your wants as to engine. $2 received.

W. F., of Ohio—Your centrifugal pump is not new, and therefore not patentable. Mr. Gwynne has anticipated you.

S. P., of Boston—The fan to which you allude was moved by common clock-work. Your plan is not so clearly described as to afford us sufficient data to judge whether or not you could obtain a patent.

N. N. & Co., of Ga.—Smee's Electro-metallurgy is the book you want; if there is a bookseller in your place he can procure it for you.

W. C. B., of N. B.—You should have the fire under the boiler and a return flue on each side, the stack being in front. See a communication on this very subject in the last number of the Sci. Am.

J. G., of Ind.—We believe it is now a settled matter that there is no difference in the Atlantic and Pacific Oceans where they are separated by the Isthmus.

J. F., of Ohio—Boiler feeders acting independently of the engine are well known.

J. K. of C. E.—There is no work published here on marine railways and ships. It would be instructive for you to visit our section docks—they embrace the latest improvements.

C. H. M., of N. Y.—There are two kinds of corns—hard and soft; the latter is the most painful and difficult to cure. The hard is cured by paring deep and softening them with a solution of sal soda or a weak potash lye: we do not know of a better plan for soft corns also.

T. B., of Ind.—Search the newspapers for advertisements of brick machines; there are hundreds of them; we could not begin to tell you all. $1 received.

E. C., of Ga.—Address Shank, Downing & Co., N. Y. city, for window glass.

W. W. A., of Ind.—The French have adopted the centesimal system. Rabate means to cut down or deduct. What makes you imagine that new logarithmetic tables are required for centesimal measure. The "solar compass" is a flower that grows on the prairies, and turns its head with the position of the sun.

J. S., of N. Y.—If the foreign use of the article is not known to the Patent Office here, a patent could be had and would be valid, provided the applicant made oath that he believed himself to be the first inventor.

W. H. M., of Pa.—There is nothing patentable in your churn.

A. W. McD., of N. Y.—We understand that Prof. Porter has not completed his Aeroport, and in all likelihood he never will.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, June 16:—

J. C. D., of N. J., $100; R. A. P., Jr., of Mass., $35; F. K., of Mass., $25; G. R. T., of N. Y., $25; H. H. F., of Miss., $108; W. V. G., of Ct., $30; D. N., of Mass., $30; E. E., of Ct., $30; C. F., of Ct., $55; J. S., of N. Y., $30; P. & S., of Mass., $25; W. G. H., of Pa., $30; L. C., of N. H., $30; J. J. D., of Ct., $32; E. H., of Ct., $30; L. O. L., of Ill., $30; J. T., of Ct., $25; D. B., of Vt., $10; J. F. S., of N. Y., $35; S. T. P., of N. J., $25; J. H., of N. Y., $35.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, June 16:—

S. T. P., of N. J.; C. F., of Ct.; G. R. T., of N. Y.; W. C. W., of Mass.; F. K., of Mass.; H. H. F., of Miss. (4 cases;) C. F. B., of R. I.; P. S., of Mass.; E. E., of Ct.; J. H., of N. Y.; J. T., of Ct.; E. K. R., of N. Y.; B. F., of Ind.

Important Items.

Back Numbers and Volumes—We have the following numbers and volumes of the Scientific American, which we can supply at the annexed prices:—Of Volume 5, forty numbers, bound, $1,75. Of Volume 6, all; price in sheets, $2; bound, $2,75. Of Volume 7, all; price in sheets, $2; bound, $2,75. Of Volume 8, none complete, but about 30 numbers in sheets, which will be sold at 50 cents per set. Of Volume 9, bound, $2,75. Of Vol. 10, all except Nos. 17, 25, 26 27, and 28, at the subscription price.

Models—We are receiving almost daily, models of inventions which have not the names of their inventors marked upon them. This usually prevents us from taking any notice of them whatever. We shall esteem it a great favor if inventors will always attach their names to such models as they send us. It will save us much trouble, and sometimes prevent the model from being mislaid.

Patent Laws, and Guide to Inventors—Congress having adjourned without enacting any new laws pertaining to applications for patents, we have issued a new edition of the old laws, which may be had at our counter or sent by mail. This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office Price 12½ cents per copy.

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years, can obtain a copy by addressing a letter to this office, stating the name of the patentee, and enclosing $1 for fees for copying.

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THE DAILY SUN—Mail Subscribers.—The morning edition is forwarded by the early mails to country subscribers, at $1 per annum, or $1 per quarter payable in advance. The postage under the present law is as follows:—To any Post Office in the State of New York, 78 cents per year, payable quarterly, 19½ cents in advance. To any Post Office out of New York State, but within the United States, $1 56 per year, payable quarterly, 38 cents in advance.
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NORCROSS ROTARY PLANING MACHINE.—The Supreme Court of the U.S., at the Term of 1853 and 1854, having decided that the patent granted to Nicholas G. Norcross, of date Feb. 12, 1850, for a Rotary Planing Machine for Planing Boards and Planks, is not an infringement of the Woodworth Patent.

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Science and Art.

The Art of Dyeing.—No. 26.

BROWN COLOR ON WOOLEN GOODS—A brown color can be dyed on woolen goods with the same stuffs as those used for common brown colors on silk, the only difference in the process being the boiling of the woolen goods and all the dye stuffs together, instead of dyeing them in tubs at nearly a scalding heat. Brown colors on wool, however, are generally dyed with different dye stuffs from those used for silk.

CAMWOOD BROWN—Common browns are dyed on wool with camwood, fustic, a little sumac, and logwood. For ten pounds of goods, boil them for one hour in the liquor of four pounds of fustic, two of camwood, half a pound of sumac, and one pound of logwood. These dye stuffs, in chips, may be placed in a bag, and the goods entered and boiled for one hour in the kettle, without any mordant; they are then lifted, and about two ounces of copperas and two of blue vitriol are added, and dissolved in the liquor, the froth skimmed off, and the goods re-entered, and boiled for half an hour longer, when they will be found of an excellent and durable color. They are then lifted, and well washed, and are ready for dyeing. Every variety of brown shade can be dyed on wool with these stuffs, and in the manner described, by proportioning the quantities, using less logwood and saddening (copperas) for light shades, less red (camwood) for yellow shades, and less yellow (fustic) for red shades.

PURPLE BROWN—This color is dyed by giving the goods a dark purple dye, with logwood, alum, tartar, and the chloride of tin, then washing them, and boiling them in a strong fustic liquor. This makes a very beautiful and durable brown color. The kind of stuffs given, if they are good, will make a rich color. By increasing the quantity of logwood and copperas the shades will be rendered darker.

FAST BROWN—The goods are first dyed a light blue in a woad or indigo vat, then boiled in a liquor of fustic, madder, camwood, logwood, and sumac, and afterwards saddened with blue vitriol and copperas. For every 10 pounds of goods it requires 5 lbs. of fustic, 1½ lbs. of madder, 2 lbs. of camwood, half a pound of logwood, and the same of sumac. Two ounces of copperas and two of blue vitriol, will answer for saddening. The goods are boiled for an hour and a half in the dyewood liquor before they receive the saddening (copperas.)

TURMERIC BROWN—For ten pounds of goods use two pounds of camwood and three of turmeric, a gill of sulphuric acid, and a pound of sumac. Boil the goods in this for one hour, then lift them, throw out one half of the liquor, replace it with clean boiling water, and add four ounces of copperas, which when dissolved, re-enter the goods, and boil again for half an hour. Now lift and wash them, and they are ready for drying.

CHROME BROWN—For ten pounds of goods. Prepare them for the dye stuffs by boiling them for three-fourths of an hour in 1 lb. of the bichromate of potash, 6 ounces of alum, and 6 ounces of red or crude tartar. They are then lifted and washed, and afterwards boiled in a clean kettle containing five pounds of fustic, two of camwood, one of madder, two ounces of sumac, and half a pound of logwood. The boiling should continue for an hour and a half. This is a very excellent and durable color.

The Atmospheric Effect of the Cannonade at Sevastopol.

A correspondent of the *Post* states that a French *savant* ascribes the unusual rains and atmospherical disturbances over a great part of Europe to the prolonged and terrible cannonade in the Crimea. It is a little curious that we heard some days ago a discussion upon the same topic here by some scientific gentlemen, and it was observed that this fact was strictly in accordance with the theory of Prof. Espy, and was assented to by Arago and some of the most accurate meteorologists in Europe.

This famous siege of Sevastopol promises to be a subject of interest to men of science as well as to men of war.

In a conversation with some gentlemen attached to the Navy, we were informed that during the Mexican war, when a large number of armed ships arrived at about the same time at the Pensacola navy yard, their continued firing as each came into the harbor, was succeeded by a tremendous whirlwind, which did much damage. We commend this fact to the attention of Lieut. Maury, whose particular business it is to look after the winds and the courses of the winds.

[The above is from the Boston *Courier;* it presents nothing new. The opinion, based upon observation, is quite old, that continued discharges of heavy artillery lead to severe storms. This was the case after the battles of Trafalgar and Waterloo.

PALMER'S GRAIN DRILL.

Fig. 1

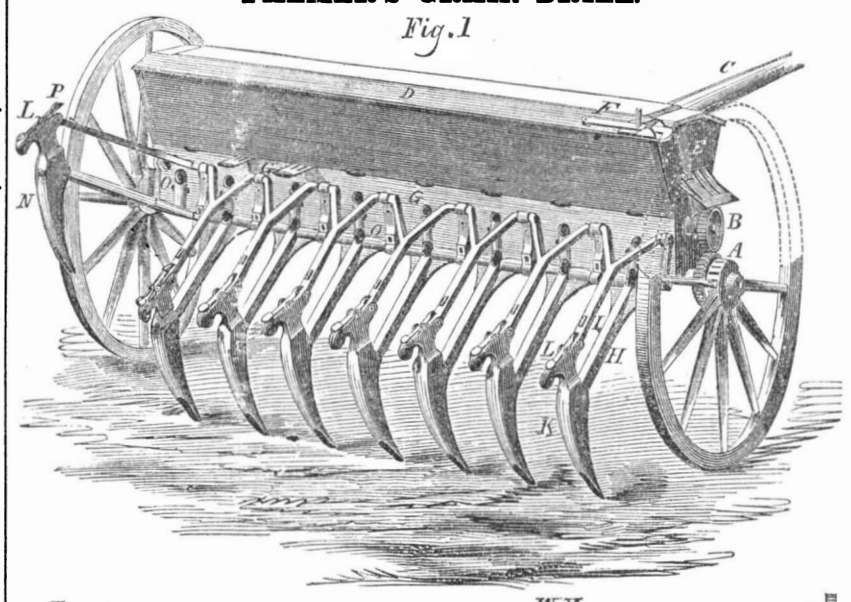


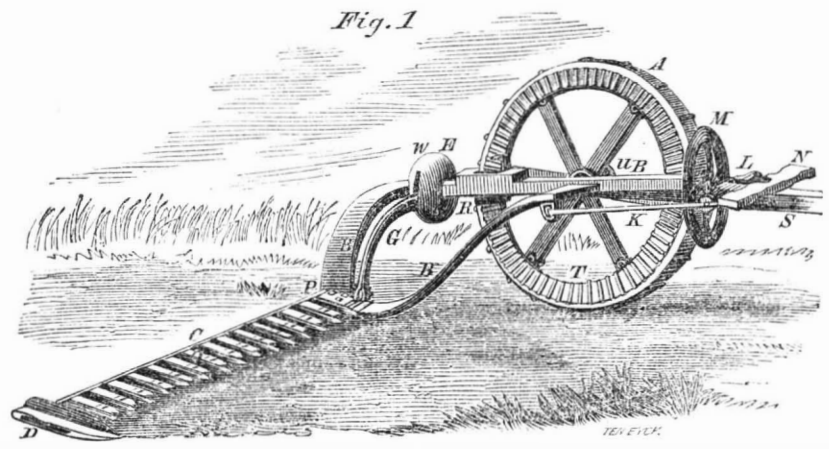
Fig. 2

The annexed figures are views of an improvement in grain drills, for which patents were granted to Aaron Palmer, of Brockport, N. Y., on the 1st June, 1849, and the 10th Sept., 1850.

Figure 1 is a perspective view, and fig. 2 is a view of the axle with its seed boxes. The seed is placed in the box, D, in the usual way. A B are cog wheels meshing into one another, motion being derived from the one on the axle of the wheel. The axle box, fig. 2, contains boxes, which have holes in them placed at intervals apart, at W X, which receive the seed from the hopper and convey it through the tubes, H K, to the ground, thus sowing the grain in drills. Each seed tube is jointed so as to be lifted like N, by its handle, L. The seed drops through the openings, G, in the bottom of the hopper box into the head tubes, O. and through the toe tubes, K, into the drills. C is the pole of the drill. E is a clutch lever for disconnecting the seed axle at S, so as to ungear the seed axle, and stop the operation of sowing, also for setting it in operation again. F is a latch to hold down the lid of the hopper.

PALMER'S MOWING MACHINE.

Fig. 1



The annexed figure is a perspective view of an improvement in mowing machines, for which a patent was granted to Aaron Palmer, of Brockport, N. Y., on the 30th of last January. The improvement relates to the frame.

A is the main driving wheel with its teeth, T, inside. It meshes into a pinion, R, on the small shaft of which is a crank to which the pitman, G, of the cutter bar is secured, which gives a reciprocating motion to the cutters, O. B B B is a cast iron frame secured on the axle, *u*, of the wheel. This frame descends to the rear of the wheel to within nine inches of the ground, where it is turned at right angles and curves down. Another part of this frame curves outward from the axle, and then downwards, and connects at P, where the cutter beam, C, is secured to it. This construction and arrangement of the frame, B, leaves unobstructed space below it, and between the wheel and the cutters, thus allowing the machine to pass freely and without clogging, over the cut grass. The difference between this improvement and that of Ketchum's is, that the cutter bar and cutter in this machine are not opposite to the plane of the wheel, but in rear of it. Neither are they in, or nearly in the same vertical plane with the axle on which the frame hangs and vibrates, but are nearly two feet in the rear of the axle, and are entirely without the plane of the wheel.

The cutter beam is made of boiler iron, in the form of the letter U. The cutter guards are inserted three inches apart, and riveted to the cutter beam, C. D is the shoe or guide divider. K is a brace (there is one on each side) attached at one end to the tongue, S, and by the other to a joint connected to the frame, B, at a point lower than the axle. L is the whiffle tree pillow, and N, the whiffle tree central beam. The pole and its adjuncts are supported by the strong braces, K. M is a regulating wheel and E a balance weight, with a slot, W, in it. By this arrangement of frame cutters, the wheel may run over obstructions, or sudden elevations of ground without affecting the horizontal position of the cutter beam. Neither does the wheel and cutter beam pass simultaneously into a dead furrow, for the wheel is drawn out before the cutter beam passes in, thereby reducing the draught at such times. Again, in cutting lengthwise of the furrow, the wheel may run in it, and the cutter beam preserve its horizontal position and cut close to the ground. The pole or tongue, S, is fastened to the frame at a point below the axis of the wheel, and the draught of the train acts on the frame, to hold the cutter beam snug to the ground; this has always been difficult to accomplish heretofore. The amount of this downward pressure can be regulated by changing the point where the braces, K, are attached to the frame. The claim is for connecting the wheel, A, the cutter beam, C, and the tongue, L, to the frame, B B B, in the manner described, by which the said frame operates as a lever, the fulcrum of which is the axle of wheel A, by which means the cutter beam rises and falls independent of the wheel, thereby adapting itself to undulating surfaces; also by which means the draught of the team holds the cutter beam snugly to the ground, and allows the cutters to cut close and smooth.

More information may be obtained by letter addressed to Mr. Palmer, at Brockport, N. Y.

Longitude of Cambridge Observatory.

Professors Bond and Cooley, astronomers, have gone to Europe for the purpose of ascertaining the difference of longitude between Harvard College Observatory and Greenwich, Eng. This is the commencement of the third series of voyages conducted by the Director of the Cambridge Observatory, under the auspices of the U. S. Coast Survey, for the accurate determination of a normal point in the Survey in regard to the Observatories in Europe.

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